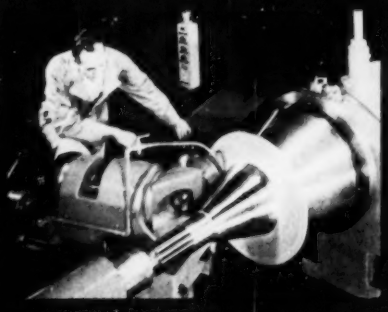
JUNE
1954

DIGEST

INTERNATIONAL BUSINESS AND INDUSTRY



MORE TRADE with Latin America is West Germany's goal. In Mexico City, a trade fair showed German goods, opened the drive for larger markets p13

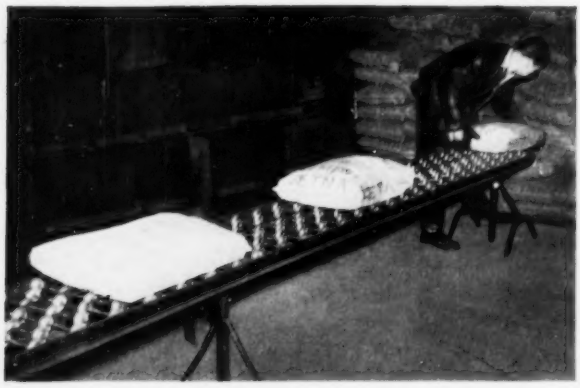
FIVE-YEAR PLANS get a new look in the Philippines; instead of a fixed goal, targets change each year p15

SOMETHING NEW in metalworking, Floturn looks like spinning, but there the resemblance ends p24

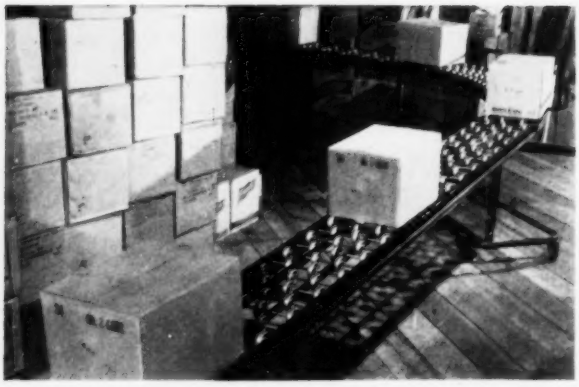
PRODUCTION-LINE FLOW speeds a pre-stressed roof-framing job. Careful timing is part of factory methods applied to a construction problem p30

YOU CAN SAVE wrecked machinery with Metalock. It's guaranteed to make your equipment as good as new p39

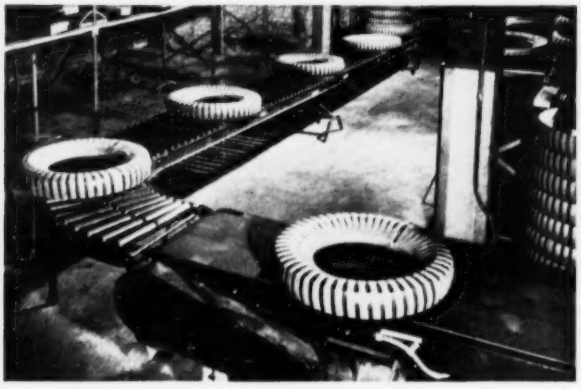
MANY PROBLEMS face coal-mine operators. How they can be solved interests more than coal men. Equipment dealers, unions play a vital part p42



Lightweight, low-cost, Rapistan gravity wheel conveyor speeds movement of bags of cement.



Straight and curved wheel conveyor units can be easily linked together to fit any floor plan.



Standard Oil Co. combines Rapistan roller conveyor with power belt unit to move tires in and out of storage.

Cerveceria Union, C.A., Caracas, uses low-cost gravity roller conveyor lines to increase production.

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Faster — and far more efficient — than the most skillful human hands, Rapistan gravity conveyors reduce breakage . . . keep materials moving at a steady, profitable pace.

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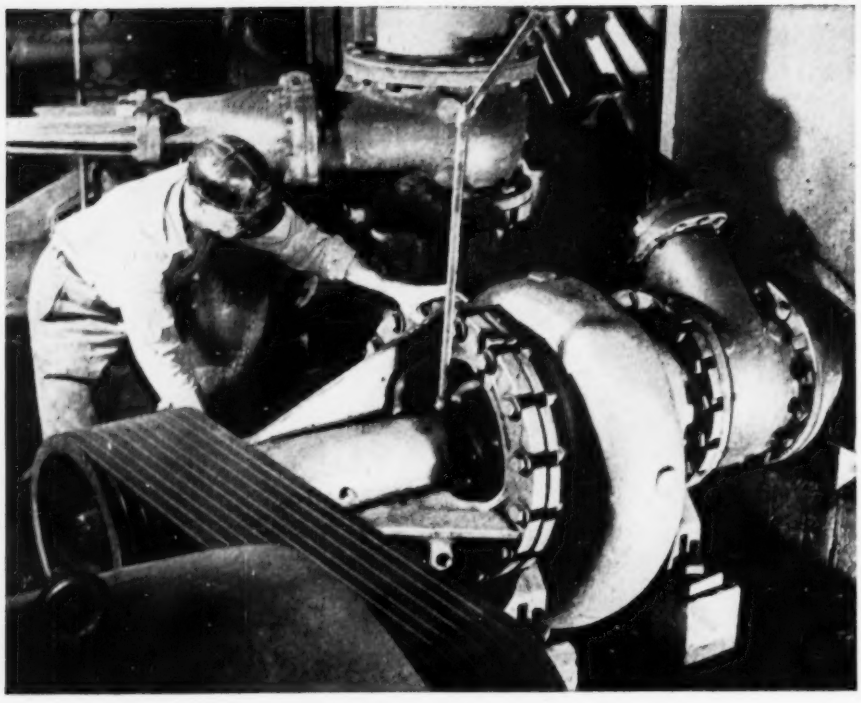

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THE Allis-Chalmers solids handling pump was developed especially for the mineral processing industries. Exceptionally rugged in construction, the unit is made of special abrasion-resistant materials to provide long service life under the most severe conditions.

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The Allis-Chalmers solids handling pump is being used successfully to handle sand and gravel, coal, rock products, cement, gypsum, chemical pulps, dolomite, bauxite, dredge water and many other solutions carrying large amounts of suspended solids.

In addition to pumps, Allis-Chalmers can supply crushers, grinding mills, screens, motors, drives and electrical control. For information on these products, contact the Allis-Chalmers representative in your country, or write:

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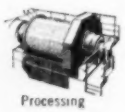
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. . . the best from 48 business magazines—see p56

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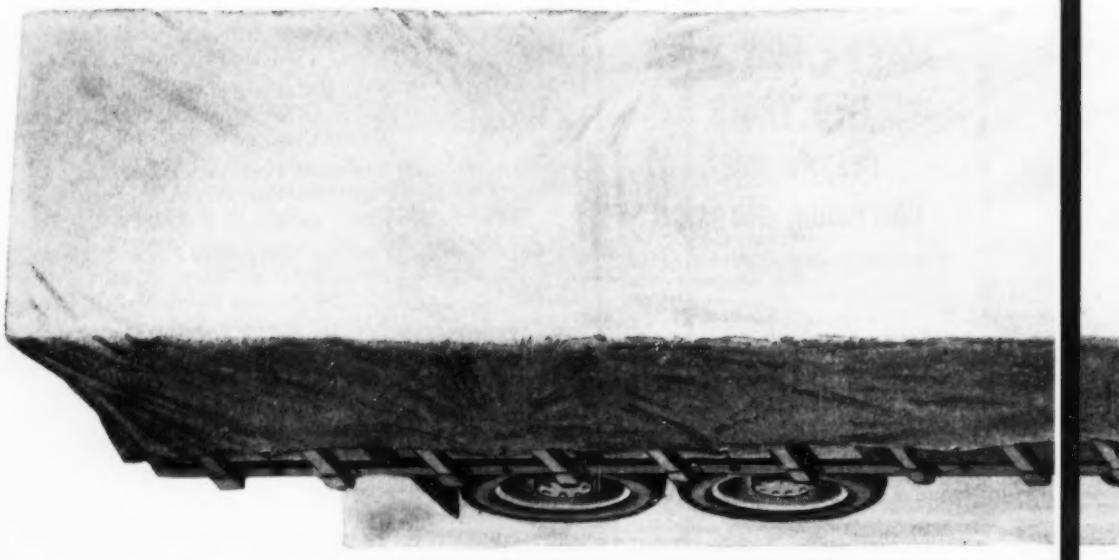

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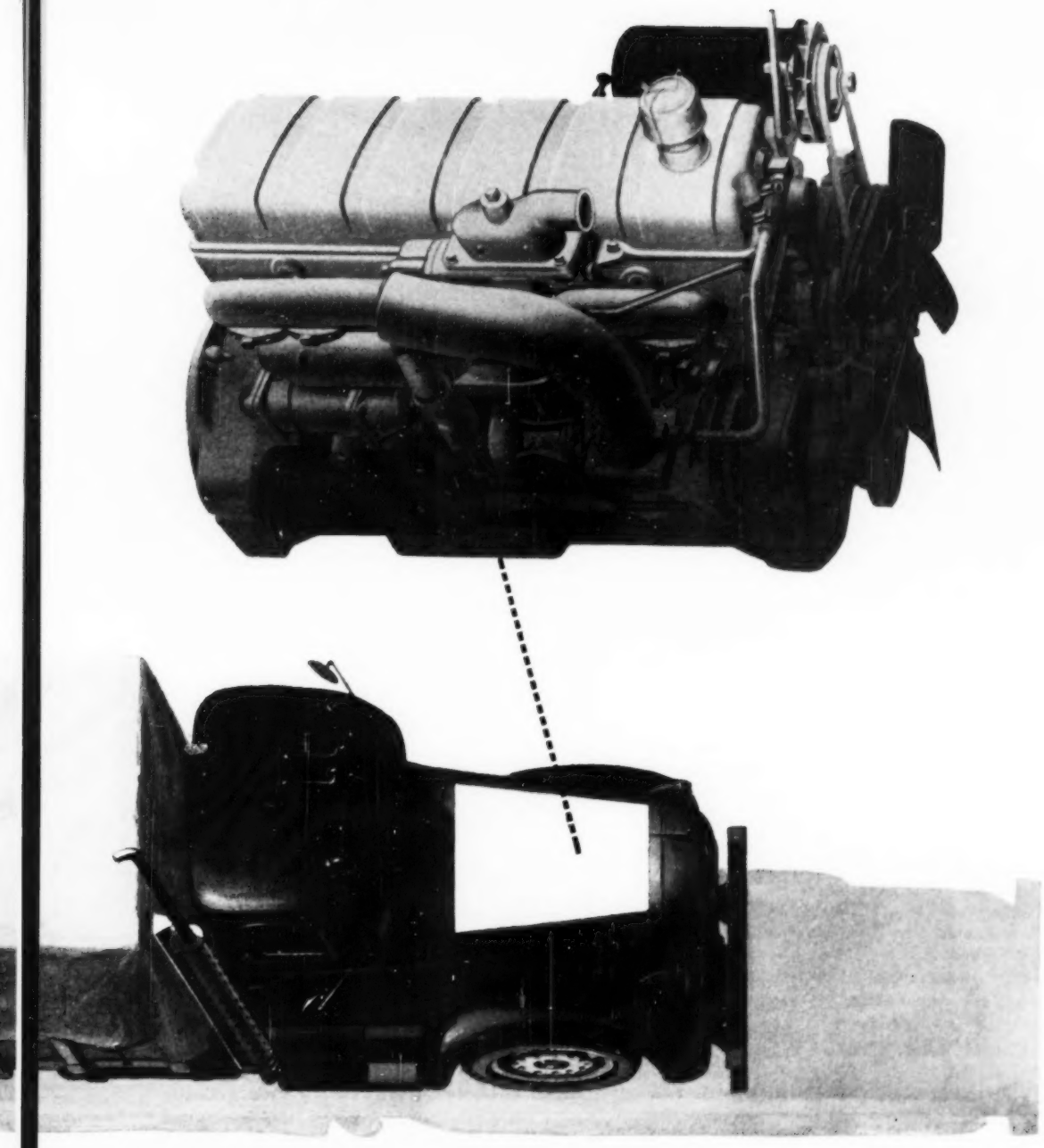

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GEARS NOISY? ...Of Course

The Gear Business has always seemed to attract colorful and positive characters. Like George B. Grant, the Dean of Gear Makers in the Gay Nineties.

Sixty years ago he gave industry a few gems of philosophy in what he referred to as his Treatise on Gears.

For Instance:

"Noise: at a high speed is unavoidable. Fibre gears are quieter and softer than metal, and raw-hide is still quieter and less durable. Raw-hide and fibre are good at high speed, but unsuitable for heavy strains.

I Am Not Responsible for Any Mistake: even if I make it myself, if it could have been prevented by sending me working drawings or good sketches. If you make me guess, you must take the responsibility. A poor drawing is better than none.

Unless Otherwise Described: every gear ordered is a cut spur gear of cast iron, and it will have such diameter, pitch, face, hole, hub, and quality as I happen to think most desirable. Describe what you want and that you will get, but if you omit any detail I may write to you for the information required or I may guess at it and go ahead.

A Fit: is guaranteed only when I have the parts to be fitted. I ream a hole with a one inch reamer, for example, but do not guarantee that it will fit your one inch shaft.

Estimates: As a rule nothing is saved by getting an estimate. A low price means a cheap piece of work, here or elsewhere.

Steel Castings: are generally full of blow holes, and it takes a long time to get them. A cast iron gear of wider face is as strong and cheaper."

If Mr. Grant could only have run a sound test on RED RING Shaved Gears.

6778

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BUSINESS TRENDS

U. S. BUSINESS PICTURE is brightening. Recent declines in production and sales are leveling off. Strong underpinning of the economy generally is revealed by a sharp upswing in manufacturers' capital-expenditure commitments and by continued record construction.

Manufacturers plan $12.3-billion outlay for new plants and equipment in 1954, according to latest McGraw-Hill survey. This not only tops 1953 but represents a sharp rebound from last fall's estimate of an 8% cut (McG-H Digest, Jan, p11).

The new totals will be cut if the recession deepens. But the big upward revision reflects new confidence in the long-range business outlook.

This year's expenditures will boost manufacturing capacity 4%, despite an expected 2% sales decline. Petroleum, food, machinery, electrical machinery and automobile makers plan bigger outlays. Chemical, steel, textile, and transportation equipment firms will spend less.

Current budgets stress modernization rather than expansion. This means cost cutting, keener competition. Most firms expect their individual sales increases during 1953-57 to triple average industry rates.

All U. S. industry plans plant and equipment outlays in 1954 of $27.2-billion—within 4% of 1953's all-time peak.

Construction (housing, highways, etc.) hit a new $7.3-billion record in the first quarter, despite steep cuts in Federal outlays. Including seasonal adjustments, that's at an annual rate of $36-billion (1953 total: $34-billion). Again it's a big upswing from late-1953 estimates.

U. S. IMPORTS of some consumer lines are expanding as a result of the April 1 excise tax cuts. But despite lowered prices, the marketing picture is mixed. Highlights:

• **Furs**—The tax cut (from 20 to 10%), although coinciding with the start of warm weather, had an immediate effect. For the first time in 10 years retailers are optimistic over autumn prospects. Department stores plan big campaigns for August sales. Mink will continue to lead sales. But Persian lamb, muskrat, and other cheaper lines will be pushed. Sales by Scandinavian, Japanese and Canadian exporters should improve.

• **Luggage and ladies' handbags**—Sales of both domestic and imported lines responded promptly to the cuts. Higher-priced goods are doing especially well. But retailers have this hint for overseas exporters: Americans prefer the bigger, sturdier domestic suitcases to the lighter, if more attractive-looking European lines. Reason: domestic product stands travel rigors better.

• **Costume jewelry**—Popularity and low prices assured this line a brisk market even before the tax cuts. French, German, Italian, and Japanese exporters, now doing good business, can count on sustained volume.

• **Watches, cameras, appliances**—Retail markets are weak for both domestic and imported lines. Sales of major watch brands are off 33%. Price cuts in imported cameras early this year were not big enough to stir the market.

THE AUTOMOBILE INDUSTRY is expanding its facilities sharply, despite an expected 6½% sales dip this year. Of all industries' capital budget boosts for 1954 (see above), the automobile makers' is the biggest: 29%. The explanation is that automobile firms are considering long-term advantages. They want to be able to meet future demand and also provide extra capacity for booms.

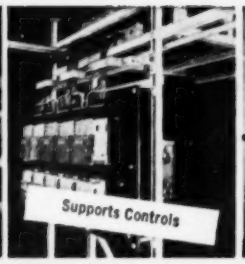
Another reason is that technical advances have made automobile production more complicated. New engines and transmissions need more machining and floor space than for older models. Some leaders feel that within 5 years every car will have automatic transmission and power steering.

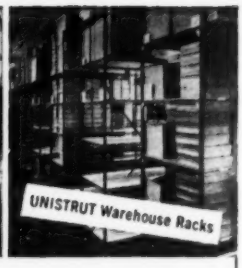
The industry is speeding ahead with automation. Example: in Ford's new engine plants, the rough engine block moves from station to station on a conveyor belt. It is positioned, machined, returned to the belt, and started on again entirely by automatic controls. Men move in only in case of breakdown or for maintenance. General Motors and Packard have similar plants under way.

RENTING OF MACHINE TOOLS is a growing practice in the U. S. Previously used only on a small scale, the idea has spread rapidly since Warner and Swasey Co. took it up recently.

Users rent a machine for 2, 3 or 4 years at annual rentals adding up to 72% of the original cost. Further rental is at lower rates. Contracts also include an option to buy.

The plan (which has not yet been extended to foreign firms) has these advantages: for machine-makers—increased business through earlier replacement of aging machines; for users—boosted production without the need for heavy capital outlays.





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No Welding **100% Adjustable**

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UNISTRUT steel channels and fittings, clamps, hangers, concrete inserts, pipe rollers, and the many other standardized UNISTRUT parts comprise the most complete and versatile framing system ever developed. UNISTRUT framing is now being used in hundreds of industries — where its application to many installation problems is saving thousands of dollars and countless man-hours.

Every UNISTRUT installation is completely adjustable and may be rebuilt for any changing purpose. Anyone can build with UNISTRUT framing. All it takes is a wrench and a saw.

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Space will not allow us to show the hundreds of applications of UNISTRUT. Ask for a catalog so that you can learn how you can use UNISTRUT to best advantage.

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INTERNATIONAL TRENDS

WASHINGTON—U. S. export controls are steadily easing. The chief reasons: (1) bigger supplies; (2) whittling of the "strategic" list. Compared with a post-Korea peak of 42%, only 25% of U. S. exports, by value, are now subject to licensing; the figure will continue to fall. Only three items (selenium, gamma globulin, and diamond bort) are still under firm quota controls.

"Strategic" goods barred to Communist lands and exportable elsewhere only by license have been cut from 1,777 to 1,521. Continued discussions among Western officials will bring further declassifications. These may include certain types of non-strategic machine tools.

Despite optimism in Britain and elsewhere, officials doubt these steps will greatly boost East-West trade. As one put it: "There's a lot of difference between inquiries from the Reds and getting cash on the barrel head!"

So far, Latin America has chiefly benefited from relaxed U. S. controls. Only 15% of exports there need now be licensed (2 years ago the figure was twice as high). Behind this cut lies the fact that there has been little or no evidence that goods sent to Latin America are transshipped to the Soviet bloc.

MEXICO CITY—Exporters to Mexico have been hit hard by the surprise devaluation of the peso. Luxury imports from the U. S. and Europe will probably drop 15%, essentials 10%. Foreigners with peso balances and contracts lost 44½%.

Many observers here doubt the step will really pay off. Although the dollar exodus was stemmed and officials predicted an $80-million export boost, spiralling prices—plus the new tax on exports—are already threatening the expected gains. The price upswing will also cut into the expected tourist boom. Foreign capital, far from being attracted to Mexico, has turned cautious.

Internationally, the cut in the apparently stable peso has aroused wide misgivings. The International Monetary Fund's approval caused surprise. Although Mexico's trade deficit was widening, its payments imbalance was mild; dollar reserves, backed by big IMF and U. S. stabilization funds, were ample.

But devaluation was keyed to the trade deficit. A spread of this philosophy, it is felt, would endanger currencies of many other trade-deficit countries.

TOKYO— Japan is bidding for its share of East-West trade. The recent decision to admit Russians for business talks spurred activity.

• **Japanese exporters want to sell** Russian floating docks, ships, fishing nets, textile machinery, rayon yarn, cotton yarn and cloth, and fruits. Importers are seeking permits to buy Russian timber at 30% under U. S. prices.

• **Exports to Communist China,** which in 1953 were only 1% of prewar, are spurting. Rayon yarn export contracts in April alone far exceeded the total for all 1953. For the first time (in bartering raw materials for Japanese bicycles) China agreed to ship before getting the Japanese products. Machinery and steel makers want government to barter machinery for Chinese rice and coking coal.

LONDON—Further steps toward gradual freeing of the pound can be expected. But key decisions are unlikely before the annual International Monetary Fund governors' meeting next September. Full convertibility—first on current, then on capital account—depends on:

1. A system of guarantees that nonconvertible countries will not hoard sterling for wholesale conversion into dollars.

2. Adequate backing. Sterling's gold-dollar reserves may top $3-billion by autumn. But probably another $3- to $4-billion will be needed. This is considered of overriding importance psychologically to prevent a run on the pound.

The pound will not be alone when it is made convertible. The West German mark, Dutch guilder, Belgian franc, Portuguese escudo, and several other units may be part of a broad plan.

MELBOURNE—This city expects soon to be the first to introduce a new and cheap method of replacing water pipes leading from mains to household meters. Developed by E. T. Splatt, city Water Services Engineer, it uses sandblasting to remove corrosion from existing galvanized iron pipes while they are still in the ground. Then new copper pipes are fitted inside the old ones. The method cuts replacement costs 40%.

An Australian firm, New Process Fiber (N.S.W.) Pty. Ltd., is making a new unwoven fabric from the canna plant. The process avoids husking of the stalks. The full stalk, up to 5 ft. long, is pressed; natural resins bind the fibers together. The result is a strong, highly flexible fabric that can be fireproofed and waterproofed and is excellent for underfelts, carpet-backing, packaging.

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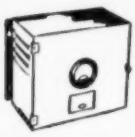

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JUNE 1954
VOLUME 9 • NUMBER 6

McGRAW-HILL
DIGEST

HOUSE OF KRUPP, symbol of West German industrial strength, comes to Mexico City as one familiar name in huge $25-million trade exposition.

CUTTING TOOLS were part of machine-tool exhibit and rated high.

Germany Bids for New Markets

Latin America saw a bright display of industrial goods at Mexico City. For Germany, a drive for expanding markets continues.—An original Digest article

MEXICO CITY—Springtime was fair time in Mexico City. But the German trade fair, which ended early in April, meant more than champagne, Rhine wine, beer, and hot dogs, although plenty of each was served to the 50,000 persons crowding the fair grounds each day over weekends and the 25,000 persons on weekdays.

It meant that Germany was back in Latin America to recover her lost markets—not only back but also in a strong position to regain her former prewar share (15%) of the whole market.

Germany's export drive is doing well. In the last 6 years, exports to Latin America paced Germany's economic recovery by rising from only $400,000 to over $400-million. Part of this gain was made at the expense of U.S. exporters, especially in Argentina, but most was made at Britain's expense.

Before the war, Germany ordinarily did about $50-million worth of trade each year with Mexico, about evenly split between exports and imports. It had reached that figure in 1952, but slipped to $36-million last year because of the slump in Mexican buying. Germany's plans, however, go far beyond these figures. That was the reason behind the $25-million trade fair at Mexico's famed University City.

So important was this felt to be that West Germany's Minister of Economics Ludwig Erhard came to Mexico to open the fair and then went on to South America—Peru, Chile, Argentina, Uruguay, and Brazil—as Germany's ambassador of good business. Germany well knows that her competition will continue to resist strongly her export drive, and Germany knows too that she must expand her present export rate if she is to maintain export surpluses and be able to settle her debts (McG-H Digest, July '53, p13).

The huge fair was the first trade show that Germany ever held on such a scale in Latin America. It was a fitting bid for a bigger share of the $800-million a year of Mexican foreign trade now largely monopolized by the U.S.

Seven shiploads of goods, worth $22-million, were sent from Germany, along with 1,500 persons to man the machinery and vehicles. Most of this equipment had "sold" tickets on them before the fair ended.

More than half the fair was devoted to automobiles and heavy machinery, 10% to electronics equipment, 15% to precision mechanical equipment, 4% to chemical products, 5% to porcelain, 10% to cameras, toys, and other consumer goods.

Germany is betting heavily on the transport equipment market in Latin America. It was no accident that the day before the fair opened, Mexico City authorities announced they were in the market for about 1,000 transit buses and 325 trolley buses. And it was no accident that the Germans had four of their best trolley buses not only at the fair but also running about Mexico City on regular runs

"Most observers thought West Germany could . . . double its sales."

and collecting fares (later turned over to the city government).

Ferrostaal AG of Essen showed a handsome trolley bus capable of carrying 100 passengers (43 seated, 57 standing).

A competing German firm, Wagon Fabrik AG of Krefeld, had a new type of bus, which it said was an integrated unit with body and chassis built as one piece. It could seat 39 with 48 standing.

In cars, the new Mercedes Benz were on display, but prices were on the Cadillac level rather than in competition with the U.S. assembly plants in Mexico that turn out Fords and Chevrolets beginning at $2,500 and up. But the new German Opel looked very much like the Chevrolet in styling and size and was priced under the Chevrolet. Henschel displayed Diesel trucks, but prices could not compete with those on similar American-made trucks.

In trains, Linke-Hoffmann-Busche announced that it had received an order for 52 self-propelled Diesel cars from the Mexican Department of Public Works for its new southeastern railway running through the jungles to Yucatan.

Machine tools are Germany's really strong point—in the eyes of Mexican craftsmen and shop operators. About a dozen lines were shown. Weipert, for example, has a 3-hp. lathe with automatic head and four speeds and reverse for $2,000, compared to a U.S. model, without these features and only ½-hp., selling for about $500 less.

New printing presses included the latest in offset by Faber & Schleicher of Offenbach, who showed their model 600 smoothly turning out fine color. It was bought by a Mexican lithographer before the fair opened. Other German presses, such as Heidelberg's new job press, were marked sold to Mexican buyers on the day the fair opened.

The heavy-machinery field included equipment bearing the famed Krupp name. Large shovels and cranes, some as large as anything ever seen in Mexico, were on display by Liebherr of Kirchdorf, Demag of Duisburg, and Seibert-Stinnes of Mulhein. Models were shown of Germany's famous floating cranes, which can pick 350-ton vessels out of the water.

What did the fair add up to? Most observers, at the close of the fair, thought that West Germany could practically count on the fair to double its sales to Mexico this year. But only a week after the fair closed, Mexico jolted financial circles in both Mexico and in many other countries by devaluing its peso—from 8.65 to 12.5 to the dollar (see p9).

That this move will slash imports sharply—and, at the same time, increase Mexico's exports—is without doubt. What it will do to imports from a particular country, like Germany, can only be judged roughly. But Germany and other countries trading with Mexico can expect rigid currency restrictions.

So effectiveness of the fair must be assessed on what it will do to expand Germany's over-all trade with Latin America, not Mexico alone. The success of the fair itself is joined by other factors to measure its effect on German sales.

These other factors include the revival of high quality in German goods, the willingness of German manufacturers to design to the local needs of export markets, the limited convertibility of the Deutchemarks, and the long-term credits that German firms have been willing to offer. Also an important factor is Germany's need for many raw materials from Latin America—cotton, lead, zinc, copper, silver, sulfur, coffee, sugar.

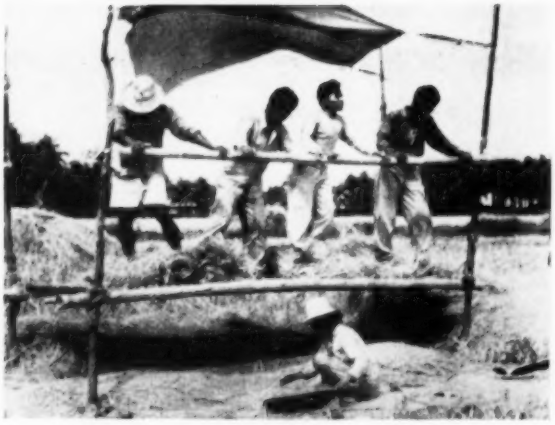
Also, of potential effect is a proposal that Economics Minister Erhard took back to Germany from Latin America. It suggested that Latin American countries set up large warehouses of raw materials in Germany for use in East-West trade. This would put West Germany in a particularly strategic position to expand trade both eastward and westward.

Long-term credits, in the future, may not be as influential in getting the contract signed as in the past. Two, three, even five years' credit was not unusual because backing the German exporter was a syndicate of foreign-trade banks operating with government aid.

Comparable American terms on similar equipment are cash or its equivalent or time drafts for 30 to 90 days; maximum terms with a U.S. commercial bank are usually 6 months. Beyond that, the American exporter can lean only on the Export-Import Bank—an uncertain prop at best.

But, in certain Latin American countries, German exporters have now extended credit to a point that is beginning to look risky. You can expect many German exporters to become increasingly careful in granting future credits.

TRACTORS received serious study from Mexican buyers. West Germany has set its sights on entering the huge Latin American farm-machinery markets.



Agriculture and handicrafts are due for a revamping under President Magsaysay's new-style . . .

Philippine Five-Year Plan

Broad plan to boost farm, power and industrial output will be revised annually to provide program for following 5 years.—An original Digest article

MANILA—President Ramon Magsaysay's government is switching its main energies from administrative to economic problems.

The anti-corruption drive that was one of Magsaysay's major campaign planks in last fall's election is well underway. Already, whole government departments have been cleaned out.

The emphasis is now being shifted toward:

1. Basic strengthening of the republic's economy.

2. Problems arising from the expiration on July 4 of the first phase of the Philippine-American Trade Act (Bell Act).

To boost the economy on a broad front, Magsaysay's economic advisers have worked out an ambitious plan. It aims both to raise national income and to distribute it more equitably.

The plan is something new in the history of economic programming in that it is to remain always unfulfilled—like the desire of the donkey to reach the carrot. It is to be revised from year to year to provide a program for the next 5 years ahead.

It is also the first Philippine plan that has been drawn up without taking American capital investments for granted, though it does count on some Foreign Operations Administration aid.

The plan is a two-pronged attack on a perennial Philippine problem—unemployment coupled with underproduction. Last year it was conservatively estimated that one in seven employable Filipinos was jobless and three in eight were only partially employed. National income per person, both employed and unemployed, averaged less than 50 cents a day.

The new program is expected to provide 260,000 jobs in the first year and 360,000 each year thereafter. These are substantial goals. But as the labor force grows by 150,000 annually, many years must elapse before the reservoir of jobless can be drained off entirely—even if the goals are reached.

Here is how the plan seeks to bolster Philippine economy in four major fields—agriculture, power, industry, and land reform:

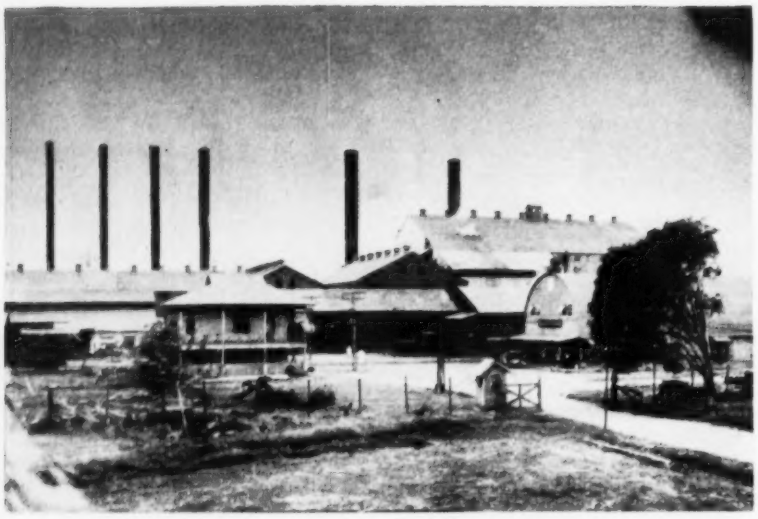
Agriculture—It calls for completion of public service projects such as irrigation and rural electrification to help expand lagging farm production. More fertilizers are to be produced. Peasants are to learn the use of farm implements and the planting of high-yielding varieties.

A network of agricultural extension services is to bring modern farm know-how to the doorsteps of remote farm households. Construction of farm-to-market roads is to help settle new areas. Facilities for rural credit are to be expanded. Cooperative and cottage (home) industries are to provide year-round job opportunities.

Most of these steps can be put into effect only gradually. But the government has also shown its ability to act swiftly in emergencies. A good example was its vigorous reaction to the rat plague in Cotabato Province, Mindanao, where 200,000 acres were stripped of crops and thousands threatened by starvation.

Under Magsaysay's prodding, Congress this spring appropriated $1-million for relief and eradication. An active anti-rat campaign

"Businessmen will be able to do business honestly and efficiently."



SUGAR INDUSTRY, typified by this big mill on Negros Island, hopes for continuance of duty-free exports to U. S. under Bell Act revision.

has been carried on with the aid of poison bait and poison gas.

Power—The plan takes a more realistic view of power development prospects than have previous Philippine programs. It shifts emphasis from glamorous but expensive and slow-moving hydroelectric projects to development of the islands' coal resources.

Production of more coal-generated power at low cost is expected to be a boon to cottage industries. It will encourage the setting up of refrigerating units for the preservation of fish, fruit, and other perishables.

Industry—Industries to receive special encouragement are textile mills using locally grown fibers; pulp and paper; food processing; leather and footwear; and building materials.

Better use is to be made of residual products. For instance, fuel alcohol is to be produced from sugar waste to help eke out imported gasoline supplies.

Land Reform—The land tenure system is to be reformed but not abolished. In practice that means that the crop-sharing laws already on the statute books will be enforced more rigorously. In addition, landless peasants will be enabled to acquire land of their own on settlement projects. Efforts will also be made to purchase a few big landed estates for distribution to their present tillers.

The cost of the plan has been put at $315-million for the first year and $400-million each year thereafter. These are staggering figures for a country whose government operates on a budget of about $300-million.

Where is the money to come from? A little more than one-half is expected to be provided by private investors, including banks. The balance will have to be paid by the taxpayer and by the U. S.

The very high proportion of private investment has been suggested by a noted Philippine economist, Dr. Amando Dalisay. He believes that economic theorists are wrong if they assume that underdeveloped economies will always remain underdeveloped without foreign investments. Dalisay is convinced that the underdeveloped tropical economies have a savings and investment potential of their own that is much larger than has been believed.

The question is: how much of this potential can be channeled into development projects? Experience has shown that Filipinos are reluctant to buy government bonds or to entrust their savings to banks.

A bond issue of $300-million is to be floated within the next 5 years. Merely turning the issue over to the banking system, as has been done with all past bond issues, might have a dangerously inflationary effect. So the government hopes to lure more savings from the "bamboo pole" (Philippine equivalent of the mattress) through the establishment of more branches of the Philippine National Bank and expansion of the postal savings system.

Exchange controls on luxury items will, at the same time, be tightened. Here the aim is to divert the more substantial savings from expensive jewelry and flashy automobiles into productive enterprises, while also conserving foreign exchange for importation of vitally needed capital goods.

The role that private initiative, as distinct from the private peso, is to play in the program seems at present somewhat limited. Magsaysay says that businessmen will be able to do business honestly and efficiently without harassment.

But official policy takes it for granted that the government must pioneer such industries as cement plants, coal mines, fertilizers, steel mills, and power development. The long-range goal is to turn them over to private enterprise as soon as they make money.

But the Philippine government has been in most of these industries for years, and has drawn handsome profits from some. And the only government businesses that have thus far been put on the auction block are those that have been consistent money losers.

The government is nevertheless by no means neglecting the need for stimulating new private enterprise. As one means of doing so, it is making available statistical and other economic information.

Meanwhile, the nation is looking forward to an economic breathing spell before the restrictive second phase of the Bell Act goes into force. A postponement of 18 months seems likely now that Washington has assured the government that it will recommend deferment to U. S. Congress.

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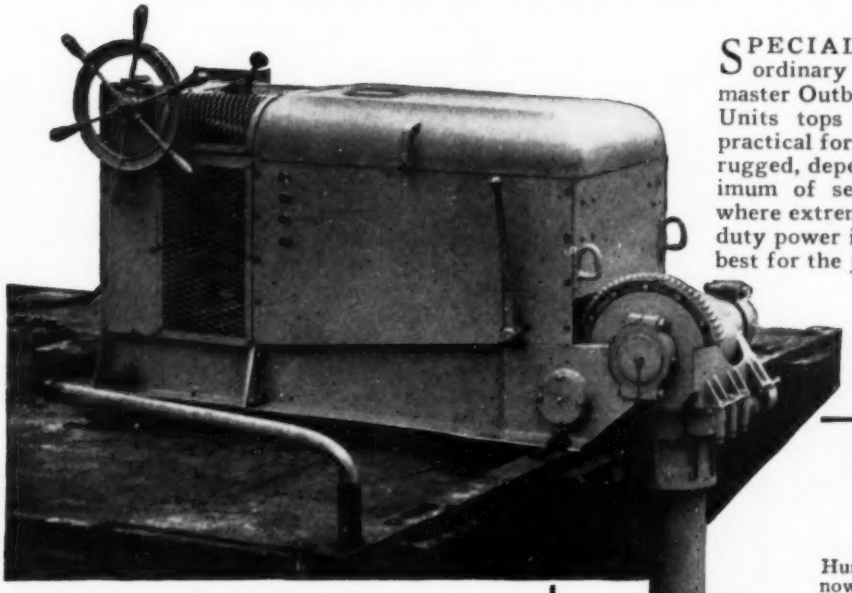

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Harbormaster Model O-41H, 50 h.p., gas power shown at left. (Model 0-42, 40 h.p. diesel is similar in appearance.)

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"Magsaysay's advisers . . . are thinking about a barter deal with the U. S."

the Philippine request, sugar and other island exports would start paying small duties in the U. S. from July 4. In the first year these imposts would amount to only one-twentieth of the general tariff rates. But rates would increase by another one-twentieth every year afterward until the full tariff rates became payable in 1974.

Like a man who has been allowed 20 cigarettes a day for 8 years but is expected to begin knocking off 1 a day every day for twenty years, the Philippines has been looking forward uneasily to the evil day.

But it is clear that the islands' plantation industries are in no position to retain the U. S. market on a competitive basis; nor have they been actively searching for new markets. Instead they have been busily lobbying for a so-called "selective free-trade" scheme.

The sudden impact of full duties would, of course, spell ruin for the Philippine economy. Rather than see chaos in the islands, Washington hurriedly assured Manila of its readiness to support a move by Congress to postpone the onset of the second phase of the Bell Act by 18 months.

Debate now centers on this question: what is going to happen during the breathing spell? As selective free trade is not considered practicable by Washington trade experts, Manila will have to think up something else.

But thinking among Magsaysay's economic advisers is already revolving around quite a different idea. They are thinking about proposing a barter deal with the U. S. on the lines of the barter agreement operating between the Philippines and Japan.

In the deal with Japan, both countries have agreed on a sum ($50-million a year) to set a ceiling on the exchange of goods. The commodities are selected from a list that each drew up in consultation with the other and that is subject to review from time to time.

The arrangement differs from any that the Philippines may propose to the U. S. in that Japanese goods are dutiable in the Philippines. If a barter deal is proposed to the U. S., it would be primarily for the purpose of assuring continued free trade within the limits of the barter pact.

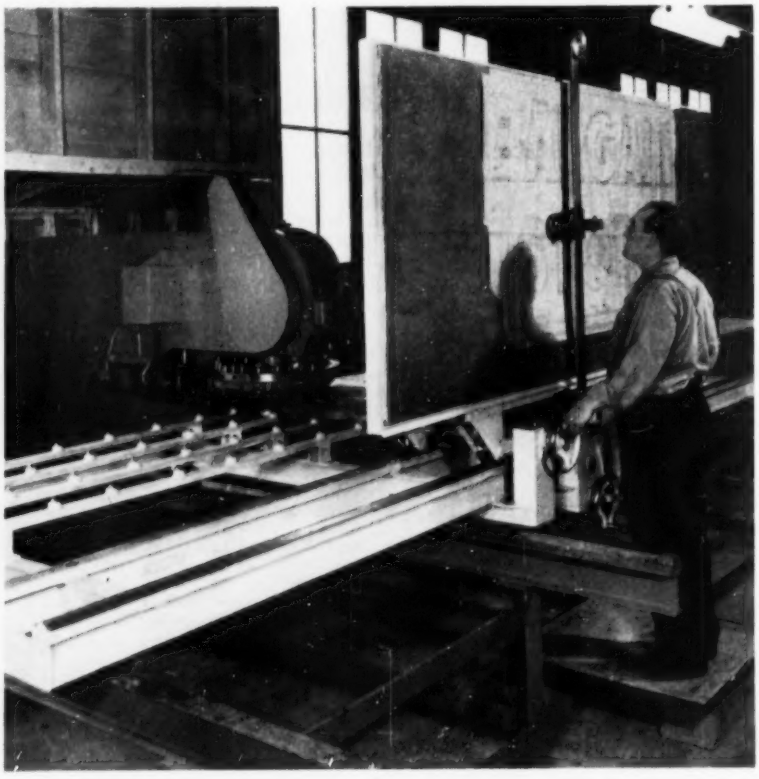
Such an arrangement would score over the selective free-trade plan on two points:

1. There would be no hard and fast list of U. S. goods, anchored to a long-term pact, that the Philippines would have to admit duty-free for many years. If a local firm wanted to make electric motors, dynamite, or newsprint—items undoubtedly to be included in the initial "free" list—it would only have to say so. The Philippine government would then substitute something else on the barter list, perhaps machinery for making these commodities, after consultation with the U. S.

2. A barter deal would counteract the tendency for the Philippines to import more goods from the U. S. than it sells. That's because the present trade pact is in terms of commodities and tonnages rather than dollars.

The chief objection likely to arise to barter is that whereas the Philippines can operate a barter deal easily enough as part of its centralized exchange and import control system, no such facilities are available to American importers and exporters.

However, it is thought that the U. S. system of quota commodities admitted from the Philippines and elsewhere could perhaps be modified to take care of the proposed barter operation.



Punches Holes from Paper Patterns

Combination turret-head punch and handling table lets Barrows Porcelain Enamel Co. punch holes from paper patterns. It eliminates re-setting tools or marking out layouts for punching different patterns on metal sheets. Holes from 1/8 to 2 in. in dia. are made by punch anywhere on a 48x 120-in. surface. Operator sees only paper pattern on board. He moves pointer to correct location on pattern, indexes the size hole he wants, and punches it. A counter totals holes punched.—Factory, April, p112

Plastic Squeeze Bottles: What Is Their Future?

Six years ago, polyethylene containers were little more than a novelty in U. S. business. In 1953, the industry turned out some 200-million of these bottles and it appeared as though it might do better in 1954. However, there are signs that the squeeze bottle industry is slowing down because of:

- High price of the product
- Uncertain marketing approach.

Price is a formidable problem. Size for size, the price of plastic bottles is three to four times that of glass. The makers of expensive cosmetics can afford the extra cost, but the company that does a business in 25¢ and 35¢ bottles cannot.

Present high cost is due to production difficulties. The big chemical companies are gradually cutting their prices as output increases, but progress is slow.

Some experts feel that merchandising is the main problem. They feel it stems from more than just the newness of the product and the smallness of the companies. The merchandising concept itself is wrong: instead of selling the product merely as a substitute for glass, the particular characteristic of the product itself should be stressed. New ways are now being sought to speed up the closure process after the bottle is filled. Bottle design for eye appeal is another subject of study.—Business WK, Mar 6, p106

Simplified Dragline Control Raises Productivity

Picture on the left shows the operator of a new 17½-yd. dragline relaxed at his controls. Scientific study of the problem of securing optimum dragline performance showed International Minerals & Chemicals Corp. how to redesign both the dragline's control system and the operator's cab to produce these results: (1) give the operator quickly all the information he needs to handle the dragline most efficiently and (2) give the operator complete visual and manual control over the machine in the simplest and most effective way. Improved control centers in the two levers in front of the operator. The one on the right swings the dragline to the right when it is tilted right, or to the left when tilted left. Pushed forward, the stick hoists the bucket; pulled back, it lowers the bucket. The left-hand stick drags the bucket back when pulled in, and causes the bucket to pay out when pushed forward. Reliable information is supplied the operator through four dials, an indicator panel, and an inter-com system. Instead of looking through boom, operator has clear view from new cab.—Eng & Min J, April, p72

New-Design Cutting Tool

From Russia come claims that a carbide-tipped cutting tool of new design outperforms conventional cutting tools. The tool has two cutting edges—an angular edge for rough machining and a secondary edge, parallel to the work surface, for finishing. A third edge, or a radius, removes the sharp point between the two cutting edges to avoid chipping it.

Flats, 0.008 to 0.010 in. wide, are made on the cutting edges, with negative rake angles of 2 to 5°. The front edge has a chip-breaker groove 0.320 to 0.400 in. wide and 0.040 to 0.056 in. deep. The basic cutting edge has a 1 to 2° side rake and 5 to 7° front clearance. The other two edges have a front clearance of 2 to 3°.

Claims for the tool are 200% longer tool life and 300% greater production.—Am Mach, Apr 12, p170

Measures Fork-Truck Use

Accurate information for measuring fork-truck performance is now available. Yale & Towne Mfg. Co. sponsored a research project to develop standard time data.

The project group studied fork-truck operations in 18 plants. It gathered data and made motion pictures of the operations. Then it analyzed both data and movies.

Now such questions as these will have simple answers:

- Do we have the right number of fork trucks?
- Are our fork trucks operating at high or low efficiency?
- How many fork trucks will we need for our new plant?—Factory, April, p84

System Saves Waste Heat

Something for nearly nothing is Sinclair Refining Co.'s gain on its new fluid catalytic-cracking unit at Houston, Texas. A carbon monoxide boiler burns flue gas to produce steam. A respray steam superheater, located in the catalyst kiln, then superheats the steam to 750°F.

The boiler produces over 300,000 lb. of steam per hr. at 700 lb. per sq. in. The superheater, besides superheating this steam, also produces another 100,000 lb. of steam per hr.

Advantages of the arrangement include: (1) independence of outside steam sources; (2) steam requirements reduced because of high pressure and temperature; (3) no atmosphere pollution from escape of carbon monoxide and unburned hydrocarbons; (4) flue gas conditioned for solid removal; (5) no other fired boiler needed for startups or shutdowns of the cracking unit.—Pet Proc, Mar, p352

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Could their plans get *gold* from *aluminum*?

Hart (Pty) Limited of Durban, South Africa, works no magic. It *does* know how to plan, organize and make sales—the only sound method of making "gold."

Aggressive management started an expansion program in 1943 that swiftly moved Hart (Pty) Limited into first place in aluminum hollow ware—while becoming Africa's largest maker of plastics, as well.

Working with their Burroughs man, Hart (Pty) Limited mechanized their accounting system—easily kept pace with product development.

Result? Today, the vast Durban factory is turning out a huge range of high-quality products to meet demands from all over Africa and elsewhere. Hart (Pty) Limited has been able to expand the number of items they manufacture and to cost them in advance with minute accuracy. A vast new market is being developed with precision and speed.

Can your business profit from faster facts? Your *local* Burroughs man offers expert advice on modern business machine methods, and expert service. Burroughs Corporation, Detroit 32, Michigan, U.S.A.

"It's paying for itself," says Mr. C. A. Rosenthal of Hart (Pty) Limited, as he inspects latest of the firm's nine Burroughs machines. *Another case where Burroughs meant better business.*

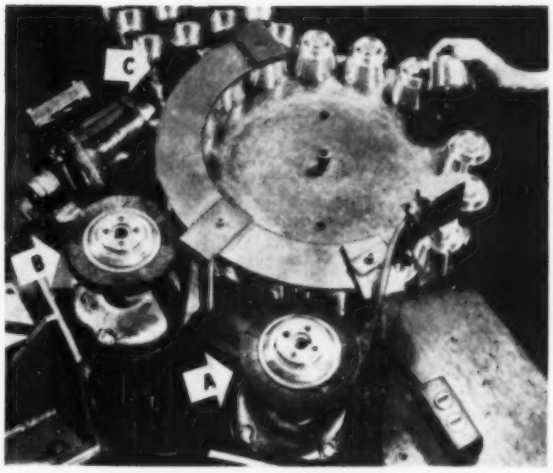
Call your Burroughs man

This Month's How To . . .

. . . raise deburring speed 300%

A change from manual to pushbutton method raised production at Gilman Eng'rg. Co., Wis. The job was to remove feather burrs from a machined slot in an aluminum fuse component. Hand output was 360 units an hour, with non-uniform results. A rotating brushing machine improved quality, boosted hourly output to 1,400 units.

Fuse parts rest on pins, do not rotate. The table rotates clockwise at 2 rpm. Three Osborn Mfg. Co. wire-wheel brushes rotate at 3,450 rpm. Brush A goes clockwise to clean one side of the slot, B goes counter-clockwise to clean the other side and C sweeps down through the slot to finish the bottom edge.—Factory, April, p111



. . . put electrons to work

One way is how General Electric Co. does it at its first pilot plant for irradiating polyethylene. Products will insulate electrical equipment and form heat-resistant, sterilizable containers for food, drugs, and pharmaceuticals. Many other uses are under study.

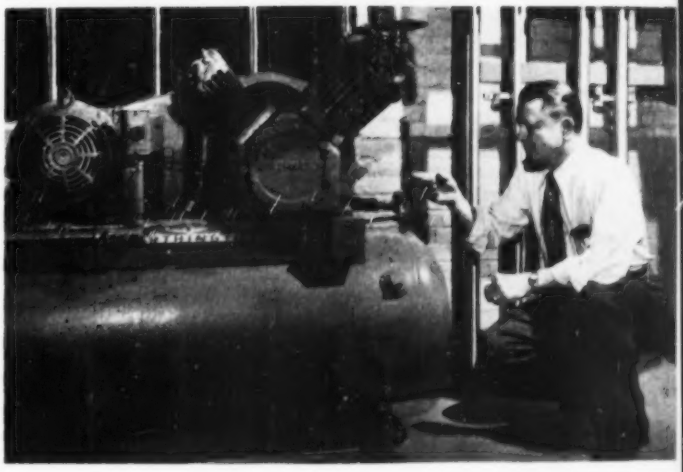
Polyethylene tape is irradiated in a cathode-ray machine capable of producing millions of roentgen units per second. The high-energy electrons affect the polymer structure, establish carbon-to-carbon bonds (cross-links) between molecule chains, and convert the material into an insoluble, infusible, non-cracking plastic.—Chem Wk, Apr 3, p69

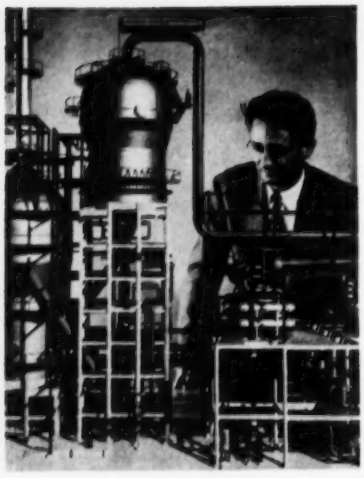
. . . stop plant accidents

Accident control pays off in terms of personnel morale. It also is good business. At the Charles Pfizer Co., accident troubles were solved with this unique approach. Medical-department records revealed that there were more slips and falls in February, more strains and sprains in September, more eye accidents in March.

Accidents were caused mostly by unsafe acts. This meant safety had to be sold to each employee. So:

- Monthly safety meetings were held at all personnel levels. The safety department provides the impetus for these meetings by circulating memorandums highlighting the most common accident for the month.
- Periodic inspection was made of equipment, tools, and machines.—Power, April, p86





Model Cat Cracker

Scale model of Shell Oil Co.'s new $12-million fluid catalytic cracking unit is helping Foster Wheeler Corp. to engineer the job. Its $10,000 cost will be more than repaid by the time it saves and the trouble it avoids. It is now on the construction site, aiding the construction and operating crews. Its use points up that accurate scale models are becoming essential working tools in engineering modern, complex process plants.—Chem Eng, Apr, p138

Helicopters—Useful But Not Yet Perfect

A review of helicopter operations of the U. S. Army led to these conclusions:

- Cargo helicopters have proved their usefulness.
- A sound procurement policy is necessary to insure industry production potential.
- Close supervision must continue to insure effective policies and procedure in the use of helicopters.

The cargo helicopters in use are excellent machines, but they still have many shortcomings: small lift capacity, high maintenance requirements, high degree of complexity, relatively low service life of component parts, and variations in performance when conditions are not ideal.

The ideal machine would be a simple, rugged, easy-to-maintain piece of equipment. To this end, future designs and proposals are being reviewed. It was also noted that capabilities of the individual aircraft as stated by the manufacturer were often optimistic.—Aviation Wk, Mar 22, p25

New Stockpile Policy

It will benefit raw-materials producers abroad as stockpile goals have been raised to avoid import restrictions. —An original Digest article

EISENHOWER'S administration strongly supports its program for more imports from free-world nations (McG-H Digest, May, p9). So it has turned down new demands from U. S. miners for protection against foreign metals and minerals.

At the same time, it has offered what some political observers consider to be a bribe to domestic miners—in the form of new stockpile purchases—to offset their pleas for bigger import restrictions on lead, zinc, and other metals and minerals.

The President's Inter-Agency Mineral Policy Committee has been working since last November on a program to aid the depressed U. S. mining industry. It now has sidestepped the tariff issue and recommended use of the strategic stockpile as a prop for U. S. producers.

What does this mean to raw-materials producers abroad, who have been worried about sagging commodity prices? The administration's decision to boost metal and mineral stockpile goals quickly bolstered sagging markets. Within a week after the announcement, lead had climbed from 13 to 13.5 cents, zinc from 9.75 to 10.25 cents. (Then the fear of an expanding war in Indo-China boosted prices still more.)

Washington neither knows how much will be spent nor how soon, nor for what metals under the new stockpile program. The White House said simply that because of security reasons additional stockpile acquisitions of metals and minerals will be made "over a considerable period of time . . . wherever possible, from domestic producers." No individual commodities or tonnages were disclosed, nor was a preference scheme spelled out.

Does expansion of the stockpile mean much new buying from foreign producers? Probably not. But it does mean, for the time being anyway, that new barriers will not be put up against metal imports. It also means, of course, support for metal markets in general.

Behind the stockpile expansion program were the demand by domestic metals producers for more protection as their sales slipped. They looked to the stockpile for more business. But, by the first of this year, 80% of total stockpile goals were either on hand or on order. Goals for 38 of the 76 commodities being stockpiled, particularly important domestic metals like lead and zinc, had already been reached. So the new policy will create new demand for metals.

Considerable doubt has already been voiced about the new policy—mainly, by domestic mining spokesmen and by Congressmen from western mining states. Congressmen are skeptical that it will provide a special market set aside exclusively for domestic producers. And the producers have been calling it a short-range program that will give their industry only temporary relief.

Foreign producers and producing countries should recognize that the new policy may not mean permanent leveling of barriers to metal imports. They should watch for introduction of new bills to limit new stockpile purchases to U. S. mines and to set up import restrictions.

Senator Dworshak (Idaho) has already introduced a bill setting up import quotas on lead and zinc. And Senator Malone (Nevada) has introduced one to offset the reciprocal trade program; this bill would set up an inter-agency government body (with no State Department representation) authorized to establish new import restrictions as an aid to defense industries—mainly, mining.

Neither of these bills has much

Process Halves Sludge, Cuts Disposal Costs

The Dorr Co., Stamford, Conn., has a new process for continuous thickening of sewer sludge. It is called the Dorrco Densludge Process. The process entails continuous withdrawal of the sludges involved and controlled thickening.

Sludge volume is decreased up to 50% as compared with that produced by the usual methods with a resulting decrease in required digester capacity. Digester supernatant liquor is eliminated.

The new process places sludge removal from clarifiers on a continuous basis and separates the functions of sewage clarification and sludge concentration. Continuous removal of dilute underflow permits clarification unaffected by the by-products of sludge thickening.

When applied to the activated sludge process, part of the mixed liquor is normally combined with primary sludge prior to thickening. With the modified sludge-aeration process, a portion of the return sludge is passed to the thickener.

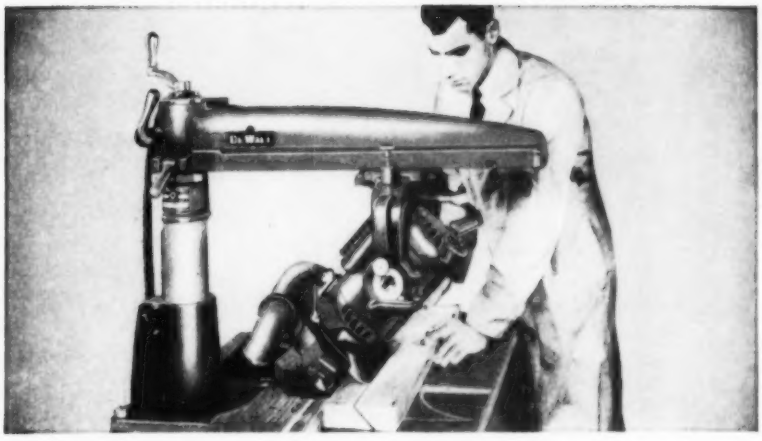
The new process will increase—at relatively low cost—the capacity of sludge handling facilities in existing plants. Similarly, in new plants smaller facilities will be required.—Eng News-Rec, Mar 25, p93

New Steam-Heated Pipe

New type of aluminum pipe simplifies heating of pipe lines in chemical and other plants. It is described as a steam-traced pipe having an integrated steam line instead of the conventional external steam jacket.

The pipe resembles the figure 8 in cross-section. Steam passing through the integrated steam line —the lower part of the figure 8— supplies the heat.

Aluminum Co. of America and Hercules Powder Co. developed the pipe. Tradenamed Unitrace, it is being offered by Alcoa to ease such jobs as handling tars, pitch, and similar solutions and to prevent products from solidifying or crystallizing in the lines. —Chem Wk, Apr 3, p60



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...every time you change the cutting tool you have another machine!

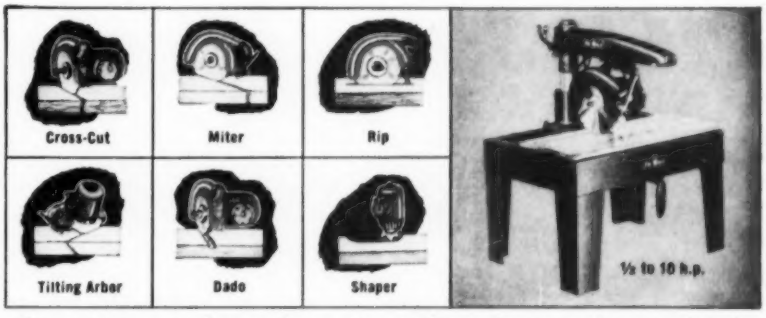
DeWalt is the world's most popular power saw, with over 100,000 now in use.

Because of their *unlimited flexibility*, DeWalts are being used for all types of construction, for public works projects—and for literally hundreds of uses in the woodworking, metalworking and plastics industries.

They are essential to any industrial plant for plant maintenance, pattern making, and boxing and crating.

The all-purpose DeWalt is many machines in one for the price of one. Changeovers from one job to another are easily and quickly made simply by changing the cutting tool.

In every part of the world, DeWalt users are cutting costs—with speed, accuracy and safety.



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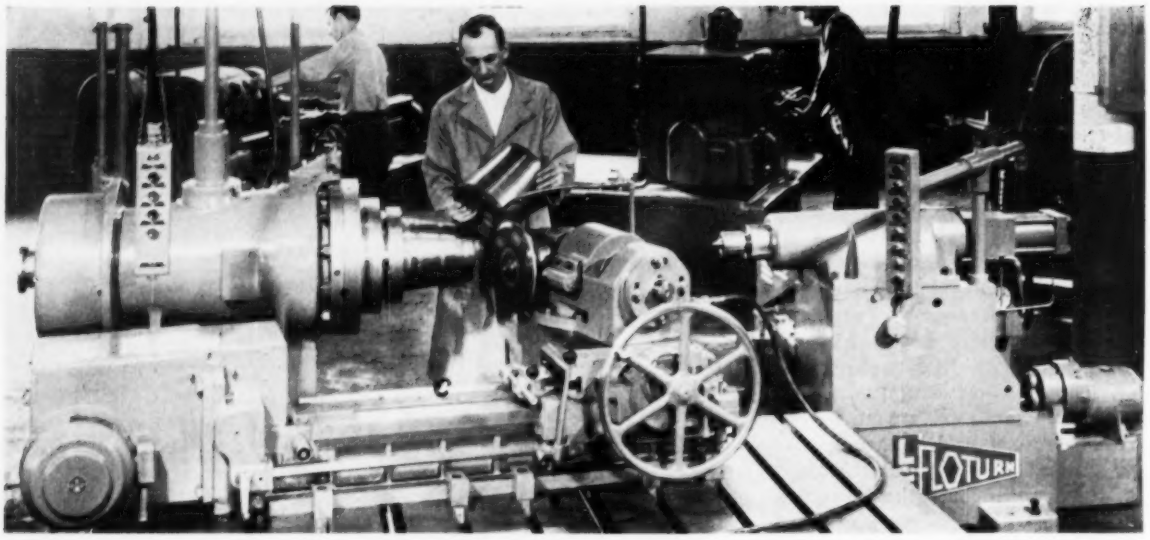


FLOTURN LATHE, made by Lodge & Shipley, forms symmetrical shapes by a hardened roller. Parts range in size from a few inches in diameter to cones for the largest aircraft jet engines.

Floturn Shapes Sheet Metal

Entirely new concept in plastic reformation is roll flowing, which shapes parts that usually require mass-production quantities to show economies

FLOTURN PROCESS cold-forms hollow cones and cylinders from flat sheet-metal blanks, drawn cups, or machined blanks. Parts may be of regular or varying cross-section and have indented or corrugated surfaces and flanged ends.

The new process looks like spinning, but there the resemblance ends. In spinning, the blank diameter is considerably larger than the product diameter, the metal is folded down onto a mandrel, pressures are moderate, and the metal is seldom thinned to any great extent.

In the Floturn process, the blank is the same diameter as the finished product. The metal is thinned as much as 75% or more in one pass by one or more rollers forcing the metal against a hardened mandrel. No metal is removed.

Workpiece dimensions depend almost entirely on mandrel accuracy and how closely the roller follows the mandrel. Wall thickness can be held within ±0.002 in. As metal ahead of the roll is not disturbed, stopping at any point leaves a flange on the part.

Cold working of the metal by the roller increases its tensile strength and hardness. Type 302 stainless steel showed a 100% increase in strength and an increase to 57–59 Rockwell (with a 30-kg. load) from the annealed condition.

Metals that can be formed by roll flowing include steel, titanium, Monel, K-Monel, Inconel, Inconel-X, Timken 16–25–6 and 17–22S alloys, Haynes Multimet, Universal Cyclops Uniloy 19–9 alloys, aluminum, copper, and brass.

Blanks for roll flowing include:

- Flat pieces—round, square, hexagonal, or octagonal, depending on the shape of any flange to be left at the end of the part.
- Cupped blanks.
- Shaped cylindrical blanks machined from forgings, centrifugal castings, or press-formed shapes.
- Cones or cylinders made by wrapping sheet or shaped (rolled or extruded) stock into the desired shape around a form and welding the joint.

Forming is done under a flood of coolant applied just ahead of the point of contact between roll and work. The coolant may be light and medium viscosities of lubricating oils, cutting oils, or conventional shop mixtures of soluble oil.

A special lathe has been developed for the process by Lodge & Shipley Co. The Floturn lathe is similar to a power spinning lathe, but it can apply pressures considerably greater. The spindle is driven by a 20-hp. motor. A motor-generator set and control panel give spindle speeds from 333 to 1,000 rpm. at constant horsepower and from 33 to 333 rpm. at constant torque.

The tailstock housing is clamped to the bed hydraulically. The tailstock spindle is positioned hydraulically to hold the blank

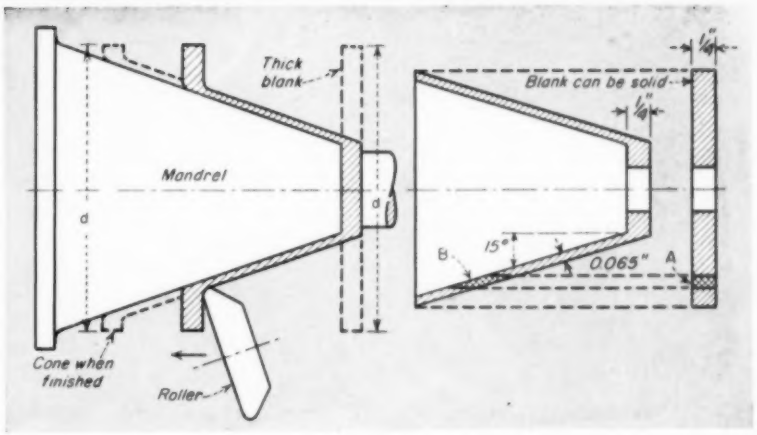
against the end of the rotating mandrel. The roller is mounted on a carriage that can be swung at an angle on the bed to permit roll-forming cones with 100° included angle. The roll carriage has a hand-wheel-adjusted slide for positioning the roller. Lathe capacity is 42-in. work diameter.

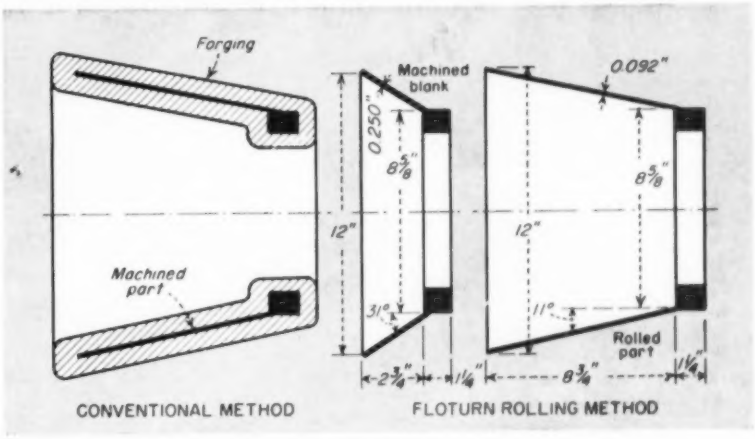
Forming rollers are made of high-speed steel, hardened on the periphery to 68 to 70 Rockwell C, and polished smooth. For blanks up to $\frac{3}{32}$-in. thick, rollers are 10-in. in dia. and have a $\frac{1}{32}$- to $\frac{1}{4}$-in. radius on one edge; the face is beveled to form 15 to 50°, depending on the severity of the forming operation.

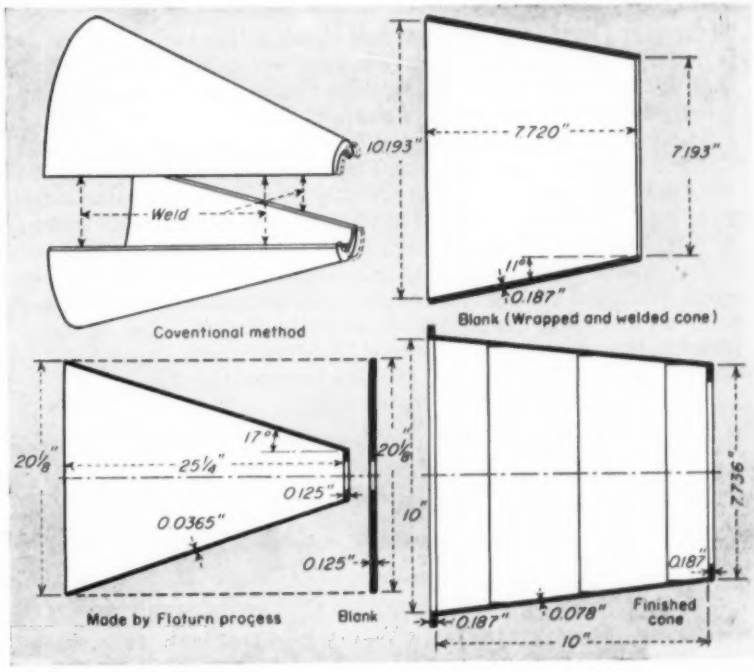
Thicker stock, up to $\frac{1}{8}$ in. thick in hard-to-form metals and $\frac{1}{2}$ in. thick in easy-to-form metals, requires 10- to 12-in. rollers with a radius of $\frac{1}{4}$ to $\frac{3}{4}$ in.

Mandrels are usually made of tool steel, hardened and drawn to 58 to 60 Rockwell C, and polished to a smooth surface. The surface must be finely finished because any imperfection in the surface will be reproduced in the work. Large mandrels can be cast to shape, with wall thicknesses of at least $1\frac{1}{2}$ to 2 in.

Speeds and feeds of roll flowing depend on the work material, part diameter, and thickness and strength of the wall section. Fast speeds, slow feeds, and a large radius on the roller generally give the best surface finishes. As the method is so new, no definite rules have yet been determined for the proper combinations of these factors for different jobs.—Am Mach, Mar 29, p104 and 150



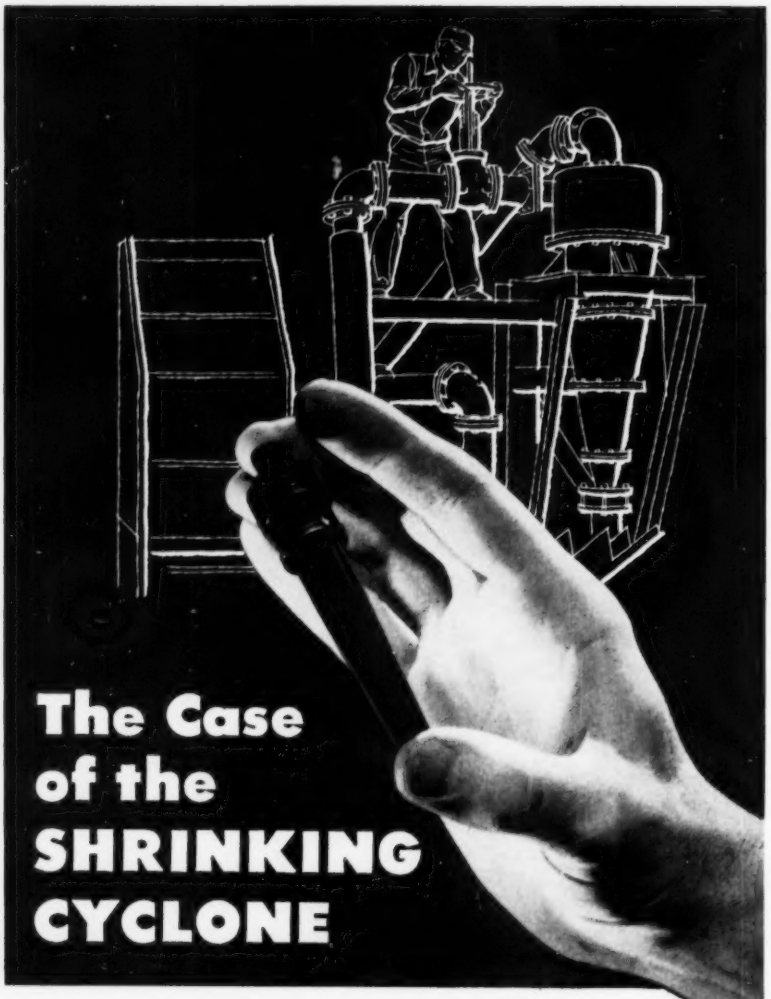




TOP—Floturn process displaces metal horizontally as the pressure roller traverses a path parallel to the side of the mandrel. Metal at A is thinned to fill the area B in the cone.

CENTER—The blank is machined from a shorter forging, thereby saving material, as compared with conventional method. Roll flowing then forms part to desired thickness and cone angle.

BOTTOM—Inner exhaust cone (left) was made by forming and welding stainless steel, as compared with Floturn part. Conical part (right) was roll-flowed from welded cone.



Today, the DorrClone—potent new classification tool—is undergoing a physical transformation. Experience has proven that decreasing its diameter increases the fineness of the separation made. Result . . . the pencil-size TM DorrClone shown above.

These bakelite midgets, nested 32 to a housing, are doing big things in filtrate clarification and fine size classification in the 2 to 20 micron range. Clays, pharmaceuticals, fillers, pigments, talc, grinding compounds — all can be economically processed by these 10 mm TM's or their companion 15 mm units of molded rubber.

The case of the shrinking cyclone is a good example of the constant evolution of Dorr machines and methods. If you have a problem involving the separation of finely divided solids in suspension, the use of ion-exchange, or fluid techniques, the chances are good that we can be of service to you through our worldwide organization.

DorrClone is a trademark of The Dorr Co., Reg. U.S. Pat. Off.

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Fuel-Oil Additives Reduce Ash Deposits

Fuel-oil ash is deposited on both boiler and superheating tubes when heavy fuel oil is burned in 900-lb.-per-sq.-in., 900°F. steam boilers. The ash cannot be removed by soot blowers and, within a few weeks, can clog the superheater tube tank. Then the tubes have to be washed with water.

Sinclair Refining Co. tried several additives to make the ash easier to remove. Barium sulfonate proved ineffective, but dolomitic lime made the ash deposit powdery and easily removed by lancing or soot blowers.

Also found effective were National Aluminate Corp.'s Additive X-223, magnesium oxide, and a mixture of 98% magnesium oxide and 2% copper chloride.

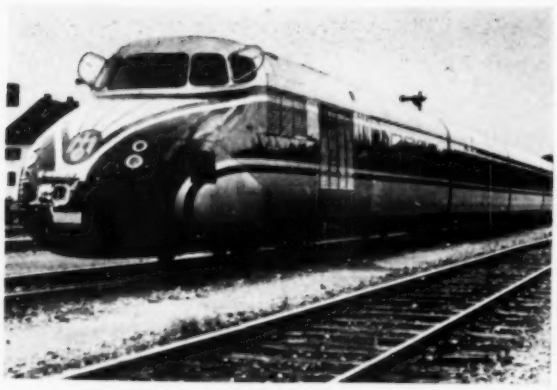
Each compound was fed to the boiler as a slurry with heavy fuel oil. A plunger-type proportioning pump fed the slurry into the fuel just ahead of the burners. The success of the additives hints that a similar procedure may be applied to heavy fuel oil for gas turbines.—Oil & Gas J, Mar 22, p171

Chemical Developments

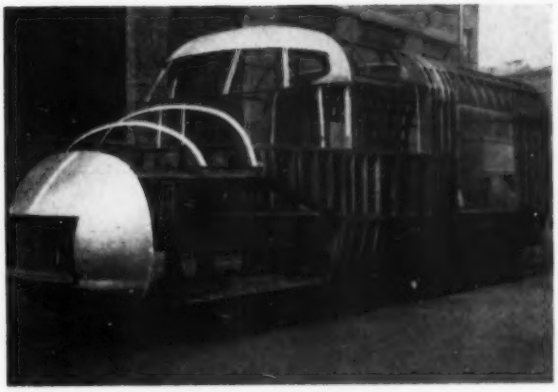
▶ **Continuous** fractional crystallization will produce 98% pure paraxylene at Phillips Chemical Co's new plant in Texas. Mixed xylenes from a nearby refinery will be processed through a primary chiller, crystal concentrator, secondary chiller, and purification column.—p106 & 181

▶ **New plastic rope** resists most acids and alkalis. U. S. Plastic Rope, Inc., Redwood City, Calif., converts polyethylene and Mylar plastic films to rope having all the behavior characteristics of natural fiber.—p144

▶ **Expected to make news** this year are three processes developed by U. S. Department of Agriculture: (1) peracetic oxidation of fats to hydroxylated fats for use as a vinyl plasticizer; (2) margarine compounding to produce a margarine spreadable at −40° F. and stable to 110°F.; (3) filtration-extraction process that should give a 98% oil yield from seed. —Chem Eng, Mar, p178



POWER at both ends permits reversing without turning train around. Front car pulls, regardless of direction.



LIGHT tubular construction without center sills increases weight/space ratio and enhances safety factor.

New Train Has Unusual Design

Aircraft-style construction makes new motor train the answer to competition from the air and highways by providing fast, good riding between cities

TWO REVOLUTIONARY lightweight motor trains, a day train and a sleeper, have been installed on a 530-mile run between Germany and Switzerland. Unique features of the trains include: greater space-weight ratio, aircraft-type construction without center sills, collapsible impact absorbers, and pivoted journal boxes. These achievements have been attained without sacrifice of passenger safety or riding quality.

Basis of the entire design is the body structure built on advanced engineering principles long accepted and proved in aircraft. Bottom, sides, and roof are integrated to form a tubular structure of high columnar, bending, torsional and compressive strength.

The elimination of center sills, except in the noses of the power cars, not only permits drastic reductions in weight, but enhances safety as well; there is no danger of the center sill of one car ripping, dagger-like, through the superstructure of another.

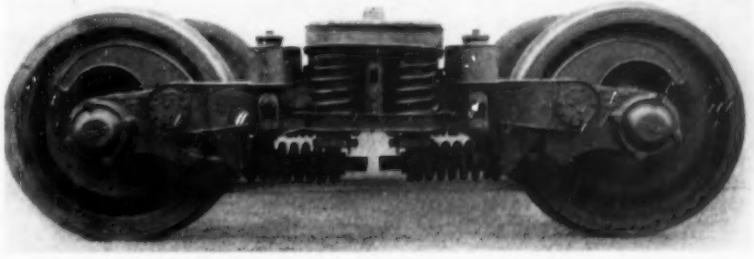
Trucks are two-axle swivel and single-axle type of a radically different design. In line with modern European practice, the swivel trucks on the sleeper train have journal boxes instead of pedestals, so the axles always remain at 90° to the rails, reducing shimmy.

Of special interest is the suspension of the single-axle trucks on the day train. A single-lever arrangement causes the axle to bisect the angle between the cars with the result that the axle is radial to the curve at all times.

Spring suspension comprises two coil-spring legs that rest in rubber on the journal boxes of the single axle between the cars. The end of one of the adjoining cars is supported directly by these legs. The end of the second car is simply hung from the first.

An original method of connecting the cars eliminates side motion on the day train. Coupling rods are held by friction coil springs in cylindrical bushings in the lower corners of adjacent car ends and connected by universal joints. There is no lateral or torsional movement between adjacent cars; the entire train forms in effect a rigid tube.

Both the day and sleeper trains have a diesel hydraulic power car 58 ft. long at each end. In each case, the entire train is articulate and two-directional. Power is furnished by six 160-hp. M.A.N. (Maschinenfabrik Augsburg Nurnberg A.G.) diesel engines. The transmission consists of a hydraulic torque converter and a four-speed constant-mesh gear train with overdrive clutches permitting fully automatic speed control.—Railway Age, Mar 29, p62



PIVOTED JOURNAL BOXES have been found to be the best method of reducing shimmying by keeping the axles perpendicular to the rails. Pendulum spring suspension increases the speed at which curves can be taken comfortably.

In TURKEY...

as in Countries Throughout the World

WILLYS Brings Progress i

ON THE FARM of the Institute of Agriculture in Ankara, students are trained in the use of modern mechanized farming equipment. In the picture above they are plowing with a 'Jeep'.

NO ROAD HERE . . . yet this Willys Station Wagon, with the *extra* traction of its 4-wheel drive, readily goes through slippery mud as it crosses a stream bed . . . an ordinary vehicle would spin and stall.

THE POLICE of Turkey rely on the trustworthy Universal 'Jeep' for its *proven* ability to take them quickly to the scene of any emergency . . . anywhere.

IN NORTHERN ANATOLIA, two instructors pause with their traveling unit in a remote region where they conduct demonstrations in modern farming methods. Farmers are shown how the 'Jeep' not only meets transportation needs . . . it does tractor work such as operating plows and other agricultural implements as well.

IN AKSEHIR, a 'Jeep' arrives from a distant town with two loaded trailers. Selective 2 and 4-wheel drive enables the 'Jeep' to pull heavy loads over back-country roads, with ample reserve power for rough terrain and for climbing steep grades.

in Transportation —

THE 'JEEP' GETS A LIFT as this giant crane helps unload a new shipment of the world's most useful vehicles at Istanbul, Turkey's major port and commercial center.

The World's Most Useful Vehicles

The Republic of Turkey, today, reflects tremendous progress—advances toward modernization for which the country's leaders can justifiably take pride.

The people of Turkey know that modern transportation is an *indispensable* aid to economic growth and development. That is why Willys utility vehicles are a familiar sight throughout Turkey . . . in the moving of produce from farms to markets . . . moving industry's raw materials and finished products . . . in the pursuits of everyday living.

Here, as by people everywhere, Willys vehicles are valued for their remarkable "go-anywhere" ability. With their 4-wheel-drive traction they transport personnel and cargo on or off the road . . . up and down mountain trails . . . over paths that never before felt the turn of a wheel. Willys vehicles have long been famed for *versatility*, *stamina* and *economy*.

Thus, Willys products meet modern transportation needs with advantages that have made them *the standard utility vehicles of the world*. They are ready to serve you.

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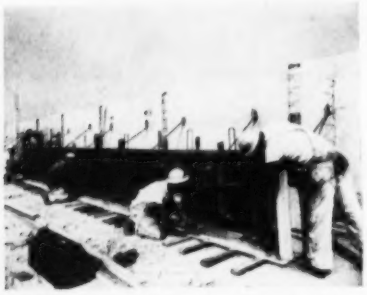
AERO WILLYS

CRANE ERECTS precast members in rear soon after casting and prestressing operations on the floor slab. Form builders and pouring crews work adjacent to stock-piled purlins and girders ready for erection.

Members Precast on Floor

With only 49 working days available, builder set up a production-line system for precasting structural members for huge concrete exhibit barn



GIRDER FORM becomes precision assembly to avoid failures.

GIRDER STRESSING (Freyssinet method) is done on a dolly.

PRESSURE GROUTING purlin wires was done after tensioning.

IT TOOK just 49 working days for Peter Kiewit Sons' Co. to build a beef exhibit barn for the California 48th District Agricultural Association.

The structure measures 338 x 232 ft. and features a prestressed roof-framing system made up of 50 girders, typically 50 ft. long and 40 in. deep, and 406 purlins, typically 36 ft. long and 17 in. deep. Usual bay spacing is 50 x 36 ft. Interior columns are precast and exterior columns are poured in place. The perimeter wall, made of precast panels, is 18 ft. high, and the nearly flat roof is poured in place.

Prestressed girders and purlins were designed by Freyssinet Co., whose system of stressing was used. A mix was selected that would produce 5,500-lb.-per-sq.-in. concrete in 28 days.

To meet the 49-day schedule an operational sequence was developed that permitted a production-line flow of precast members into their respective positions in the structure at the proper time. Wall panels, girders, purlins, and interior columns were arranged on the floor slab in a position to allow transit-mix trucks and cranes to move about. A casting, erecting or storing, and stressing sequence was used that permitted multiple use of the floor area.

Purlin and girder forms were moved from one area to the next while wall panel forms were being moved along the edge of the floor slab.

Casting of purlins and girders was a meticulous operation that required much attention to the workmanship of the reinforcing iron workers and the concrete placers. The forms, precision built, required attention to prevent breaking down. A substantial bracing of the girder forms for pouring was essential to prevent lateral movement of the long, narrow forms.

Pouring was slow because the girder web was only 6 in. wide and contained one or more of the high-tensile metal housings. This condition was not improved by the specified use of a 3-in. maximum-slump concrete.

Purlins, with a depth of 17 in., did not constitute as great a pouring problem. Air pockets on the bottom flange and pushing out of alignment of the high-tensile

cables were the main obstacles. These problems were partially overcome by pouring concrete at a slow rate.

Girder forms tended to bind in tight between the top and bottom flanges. The forms had to be heavily secured to prevent pulling them apart when stripping. Purlins were completely formed before placing steel.

High-tensile steel could not be delivered in time to keep up with the purlin production rate. In order not to slow down on the purlins, 1¼-in. round neoprene hoses were installed instead of the high-tensile cables.

After the concrete had set, the hoses were pulled out and the high-tensile wires were later pulled through. The stressing operation required three to four men at all times since it was necessary to measure wire slippage at one end and elongation at the other end, and to check gage pressure reading during the stressing of each unit.

By the time the first end wall panels had been set and secured by poured-in-place exterior columns, the first bay of girders and purlins was stressed, grouted, and ready to set. The girders were set with two cranes and the purlins by one crane.

As soon as one bay of purlins was in position, roof deck forms were set and the roof slab was poured. Each typical bay of purlins covered an area 36 x 234 ft. After stripping of the roof deck forms, a slight upward camber was still noticeable in the purlin and girders.—Const Meth & Equip, April, p78

Three Mill Developments

▶ **Double-shuttle looms** are in operation at Collins & Aikman's Downington, Pa., plant, turning out carpets made of 15-den. nylon. The carpet will retail at $13.00 a square yard.

▶ **Sheer marquisette** curtains made of Fiberglas are being produced by Hess, Goldsmith & Co., Inc. One piece of yarn is used per pick.

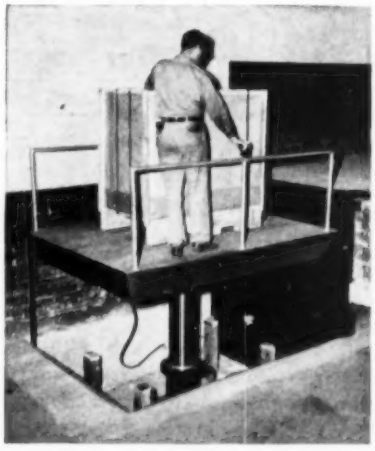
▶ **A shrinkproofing process** for knitted cotton fabrics has been developed by Alamac Knitting Mills, Indian Orchard, Mass.—Textile World, Mar, p240

GLOBE OiLIFT® *Solves* problem of moving paper and supplies between printing plant levels . . .

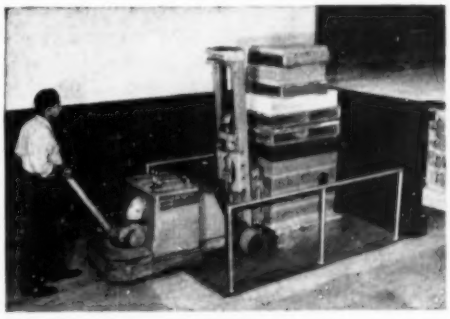
In a busy printing plant, the receiving department is about five feet below the level of the area where paper cutters and presses are located. Moving paper stock and supplies between these levels was a two-man job that often delayed presses and tied-up the company's fork lift truck.

The problem was solved by installing a standard Globe Loading Lift!

Now, material to be moved between receiving department and the upper plant level is rolled onto the 6′ x 8′ checkered-steel platform of the Globe Loading Lift. A hydraulic cylinder 10⅝″ in diameter furnishes the power that raises the platform to the upper level smoothly and *safely*. Push-button controls are located on the platform itself, and one man can handle the job of moving loads from one level to the other. This results in substantial savings in labor costs and the elimination of costly delays.



Here's a load being moved between plant levels. Operator's hand is on the conveniently located push button controls. Lifting capacity is 6000 pounds.



Here a load of paper stock on pallets is rolled onto the Globe Lift at the lower level where platform recesses flush with the floor.

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Mill Training Program Fills Replacement Need

A 3-year program to provide the mill with trained young men to replace retiring employees and to give 8 or 10 young men each year an opportunity to learn woolen and worsted methods, techniques, and processes has been successful at Forstmann Woolen Co.

The most tangible benefits of the program, according to the mill, are: (1) it gives men training as skilled journeymen, (2) it provides trained candidates as possible replacements in technical and supervisory positions, and (3) it has helped to maintain the company's high-quality workmanship.

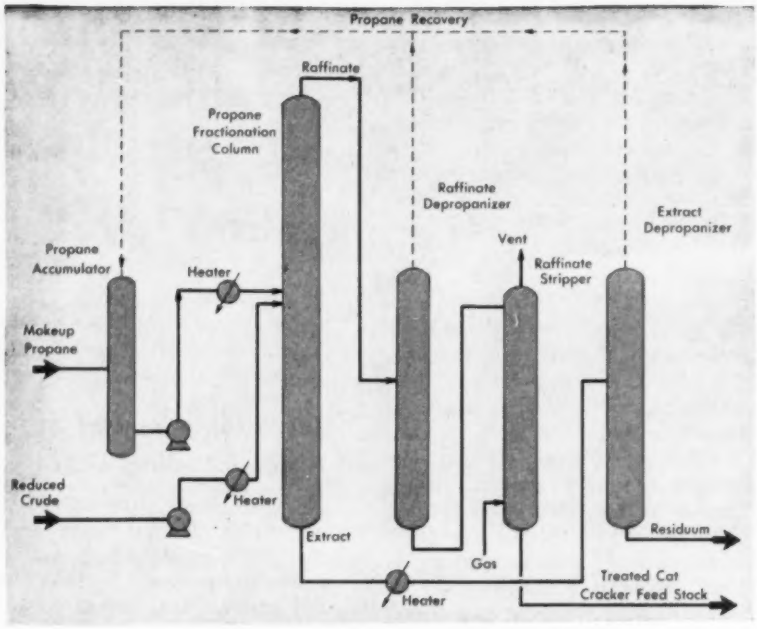
Apprentices are required to spend a minimum of 144 hr. per year in classes organized for the training program. Before an apprentice leaves one mill area, his immediate supervisors and department head rate his performance. At this time, the apprentice takes a written examination. That way the company finds out if he is ready to advance.

The top man in each class is given a year's leave of absence to pursue his studies further—at a textile school of his choice, with a machinery maker, or in some research laboratory. The company pays for his tuition and living expenses and continues his pay.—Textile World, Mar, p81

New Enzyme Tablets

Standardized fungal enzymes—amplase (Diastase) and protease—now are available in concentrate tablet forms to provide the baker with a handy, versatile tool for controlling quality and uniformity of breads.

As a result of more accurate supplementation of enzyme requirements, better hydration and development of doughs are assured. Mixing and machining of doughs are easier. Errors in weighing are entirely eliminated, and storage space requirements are minimized. Supplied to bakers under the trade name Twin Zyme (by Food Industries Co., Dallas, Texas), the tablets are easily dissolved in water.—Food Eng, Mar, p58



Higher Gasoline Yield . . .

. . . and less heavy fuel oil raise petroleum-refiners' profits and solve the bottom-of-the barrel problem. This new process promises to do this

EVER SINCE the automobile made gasoline the most valuable petroleum product, refiners have tried to reduce the output of heavy fuel oil. In the last 25 years, they have cut over-all yield of residuals from 50% to less than 20% of crude runs. But the problem still remains because the 20% volume represents only 7% value.

Several processes are being used to reduce heavy-fuel output: vacuum distillation, delayed coking, continuous contact coking, fluid coking, decarbonization, propane decarbonization, and sulfur dioxide extraction of gas oils.

A new process, now in pilot-plant stage, was announced by Phillips Petroleum Co. at the annual meeting of the American Chemical Society in March. It prepares catalytic cracking feed stocks from reduced crude oil. Gas oil is selectively separated from contaminants, aromatics, and asphaltenes by light hydrocarbon solvent fractionation.

Advantages claimed over vacuum distillation include:

- Marked reduction in the metals content of the solvent-treated oil.
- Significant reduction in carbon residue of feed stock prepared by solvent fractionation.
- Less aromatics in the oils.
- Greater rejection of nitrogen and sulfur compounds.
- Less carbon and more gasoline produced.

In solvent fractionation, a light hydrocarbon, such as propane, and reduced crude oil are heated and pumped into a fractionating column. Column pressure is about 1,000 lb. per sq. in.; its temperature is adjusted to give proper separation, depending on the solvent and crude used.

Raffinate from the column passes to a depropanizer and then a stripper. Stripped oil is then ready as the feed stock. Residuum is used for asphalt or other residual-fuel production.—Oil & Gas J, Apr 5, p58

chance for passage. But they point up how stiff Congressional opposition will be to extension of the Trade Agreements Act and other freer-trade measures.

Domestic miners are optimistic, however, since the Tariff Commission recently reported that domestic producers of lead and zinc have been injured by imports. The report indicated that the Commission will recommend tariff increases to President Eisenhower in its formal finding, about June 15.

The protectionists think this will embarrass Eisenhower's administration. Disregard of the finding would show up the escape clause as a "snare," the protectionists believe, and might impede the reciprocal trade program.

Where You Now Can Use Zirconium Chemicals

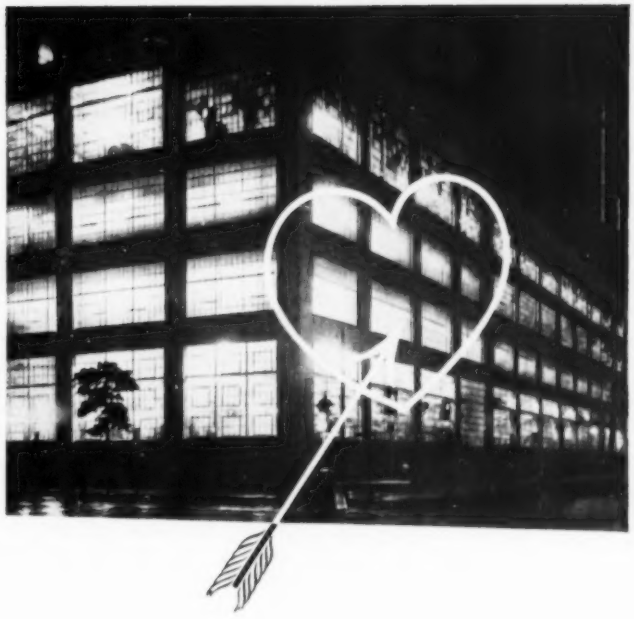
Rapid growth of the zirconium chemicals industry is extending their use into many industries. In chemical processing, zirconium compounds have shown definite value as catalysts. Reactions vary from ammonia synthesis via nitrogen and hydrogen to esterfication of ethyl alcohol with hydrogen chloride. Other fields:

Pharmaceuticals— Hydrous zirconium dioxide cures dermatitis caused by poison ivy. Zirconium compounds are also used in personal deodorants.

Textiles—Combinations of zirconium acetate and wax emulsions form effective water repellants. Several zirconium compounds are precipitants for acid and basic dyes.

Metal Refining—Zirconium tetrachloride and tetrafluoride are widely used as additives to molten magnesium to refine grain size and increase strength. Zirconium dioxide is an effective opacifier in antimony and sheet-steel enamels. Zirconia sands are important in foundry cores, molds, and facings to produce smooth castings.

Other Fields—Zirconates blended with titanate dielectrics give ceramic bodies with special electric properties for capacitors. Hydrous zirconia is a powerful absorbent for many substances. Zirconium sulfate is particularly useful in the tanning of white leather.—Chem Eng, Mar, p138



Don't be "in love" with just **part** of your business!

Perhaps you are more interested in a certain department than you are in others . . . or, because of your background, are better acquainted with its operation. Such partiality is commoner than most businessmen or government officials suppose, and more dangerous than they may suspect. Situations which could be coped with if caught early, often develop to alarming proportions. Matters which require immediate attention are often overlooked—until it's too late.

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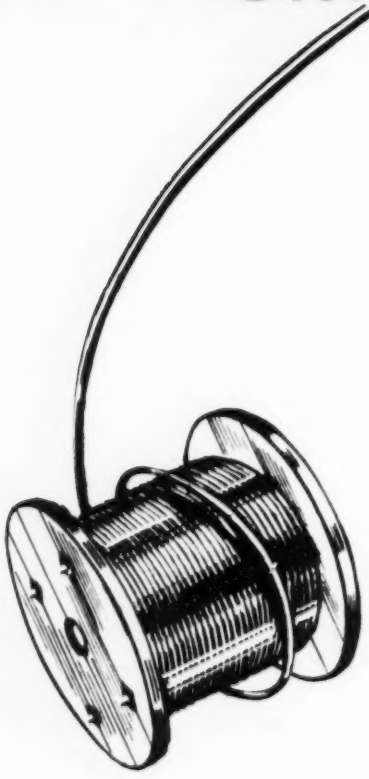

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TECHNICAL SHORTS

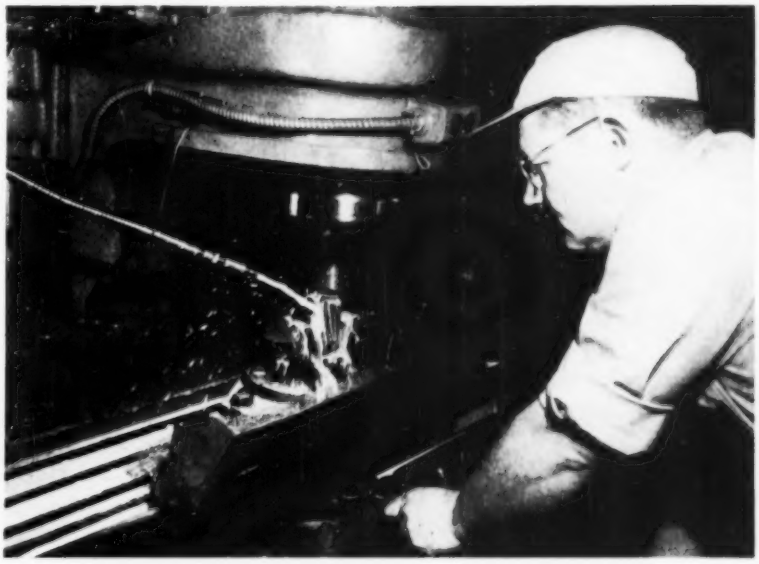
Card-data Phoned—New instrument developed by International Business Machines Corp. transmits data from IBM punched cards over regular telephone or telegraph wires. This will let large companies set up one data center and channel information to and from the center.—Pet Proc, Apr, p460

Miniature Bearings—Tiny ball bearings, the smallest only ¼ in. OD, demand extra care in manufacture. British Manufactured Bearings, Ltd., not only grades, pairs, and assembles them in air-conditioned rooms, but also does the work in pressurized assembly cabinets. All operators wear gloves to prevent staining the bearings.—Mach, Mar 13, p433

Faster Aluminum Welding—Gray Mfg. Co. speeded up welding of aluminum boxes by using helium as shielding gas. Helium and direct current permit welding three times as fast as with argon and alternating current. Job was also speeded up by using two torches and thoriated tungsten electrodes.—Weld Eng, Apr, p64

High-level Truck Crane—Farwell Co., Inc., Dallas, Tex., found the best way of getting air-conditioning equipment on top of a 40-floor building under construction was to hoist a Schield Bantam truck crane to the top floor. There, the truck crane was specially mounted and helped in hoisting 2,000 tons of equipment and materials. Setup eliminated hazard of hoisting directly over any of the surrounding busy streets.—Const Meth & Equip, Mar, p79

Electronic Noise Absorber—Radio Corp. of America has in the development stage a device that will reduce the volume of low-frequency sounds. A microphone picks up the noise and sends a signal to a loudspeaker, which sends out another sound wave to counteract the first. Result is less noise to hear.—Prod Eng, Apr, p9



Foam Cooling Lengthens Tool Life

Applying coolant by a new method increases tool life and betters working conditions at Caterpillar Tractor Co. Called foam cooling, it is done by blowing compressed air into coolant stream just ahead of the cutting area or attaching a kitchen faucet aerator to the end of the coolant hose. The aerated coolant clings to work and tool, instead of splashing off. Faucet aerators have proved particularly good.—Am Mach, Apr 12, p174

Branded Industrial Wraps—If a product has to be wrapped, it might as well be trademarked. More and more industrial packagers are using this trend. A wide range of decoration, treatments and functional qualities are available in trademarked papers.—Mod Packaging, Mar, p169

Acetylene Compressors — Allis-Chalmers Mfg. Co. is building a number of 10,920-cu.-ft.-per-min. centrifugal compressors to handle acetylene. Their unique feature: water will be injected at each of five stages to keep acetylene temperature below 200°F.—Chem Eng, Apr, p105

Cost Cutter—Friction sawing can cut metalworking costs as it is an extremely fast way to cut materials not over 1 in. thick. Average cutting rate is about 13 times that of conventional sawing.—Iron Age, Feb 18, p152

Longer-lasting Homes—Some new medium-priced houses in Houston, Texas, are being built of preservative-treated lumber throughout. Extra durability provided by high insect resistance and greater water repellency may repay higher cost.—Chem Wk, Mar 20, p78

Automatic Offices?—U. S. Steel Corp. has developed an office-machine system that links all clerical operations, records data only once, and eliminates manual copying. All machines "read and speak" the same language—punched-tape code.—Factory, April, p128

Barge Moves Gas—Unique transportation development is the shipping of natural gas by barge. Within a short time, natural gas will be liquefied, moved by barge from the Gulf Coast up the Mississippi to Chicago, and there vaporized and used for power generation.—Oil & Gas J, Mar 22, p104

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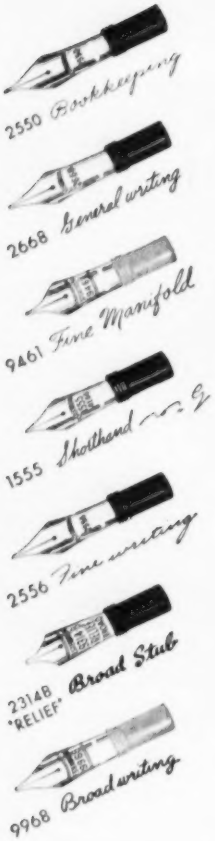

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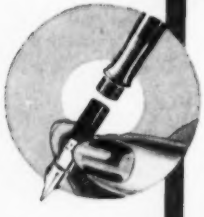

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Los Angeles May Build First U. S. Monorail RR

Since 1901, an overhead monorail railway system has been running at Wuppertal, Germany. Now a second is in prospect—at Los Angeles.

An overhead system, to cost $165-million, has been recommended by the Metropolitan Transit Authority to the governor of California for state approval. If built, the railway will be 45.7 miles long, be entirely overhead except for a 2.1-mile stretch of subway, and have 17 stations equipped with escalators.

Airline-type cars, 50 ft. long, would operate 27 ft. above street level. Maximum speed would be 60 miles per hr.; average speed, 41 miles per hr. Supporting pylons would be spaced 60 to 100 ft. apart with single rails on each side. Cost per mile would amount to $3.5-million, compared to $11-million for subways.

If financial and other problems can be solved, the system can be completed by 1959. It could handle 80-million passengers a year. Other cities considering monrail transit systems are San Francisco, Detroit, and Montreal.—Iron Age, Apr 1, p93.

Novel Inventory Method Records Stock by Voice

At Consolidated Vultee, Calif., clerks make "talking inventories." The new system is nearly three times faster than old stock-taking methods and costs 40% less.

Each stock-taker works with a portable recording machine. Walking along the warehouse aisles, he speaks into a chest microphone as he reads stock counts from tags on bins and shelves. A 150-ft. cable running from the microphone to the recorder lets him cover long aisles.

Records are taken from the recorder to a room where girls play them back through transcribers and punch the data onto cards. Convair says the system's success depends on preparing stock beforehand so that data can be easily transferred to records.—Factory, April, p128

How One Plant's Program Turns . . .

Operators Into Good Foremen

If you need good foremen, look for them in your own plant. A three-part program can find and train foreman potential among your employees

IF YOU HAVE TROUBLE keeping up with a demand for new supervisors, here's a plan that can help you. General Motor Corp.'s Kansas City assembly plant needed more good foremen. So this is what it did. It started a three-part program:

- **Recruitment** that gives every hourly employee an opportunity to try to become a foreman.
- **A selection procedure** that virtually insures that the men that enter training will be qualified foremen.
- **A training program** that gives them a well-rounded background in human-relations and staff-department functions as well as production.

The program was "advertised" in such a way that the employee could make his own decision to apply. GM felt it would make him look on the opportunity as something to work for.

As each volunteer appeared, an "employee evaluation form" was sent to his foreman. This called for the man to be rated on quality and quantity of work, attendance, cooperativeness, and safety habits.

Employees were asked to fill out an "application for consideration for supervisory training program." This called for the usual personal-history data, including education, special training, work experience.

The application also required the following information:

1. Details of any previous supervisory experience.
2. Whether the applicant has been a group leader of any kind.
3. Why he wants to be a supervisor.
4. What he feels his best qualifications to be.
5. What characteristics he feels might impede his success as a supervisor.
6. In what department or area he feels he could best qualify.
7. Whether he is willing to take a 5-hr. series of personnel tests on his own time to receive consideration.

The personnel tests are designed to show mental capacity, ability to learn, mechanical aptitude, interest in supervisory activity, personality characteristics—particularly those affecting ability to handle people. Most of the preliminary selection is done at the test level.

Men that get an above-average score on the tests and a favorable report on the "employee evaluation form" are interviewed by a panel of four management people. The panel reviews the applicant's work history and training, and asks him questions designed to reveal his poise and self-confidence, ability to express himself, emotional control and reaction under pressure, job knowledge, and ability to inspire the confidence of others.

At the completion of the interview, independent ratings are made by each panel member. From these forms, a consensus report of foremanship potential — very limited, below-average, average, above-average, or outstanding—is made. Assigning the trainee to a department for training is the final step in the selection procedure.

The 21-week training program is divided into two phases, which run concurrently. Throughout the program, the trainee spends half of each day on each phase:

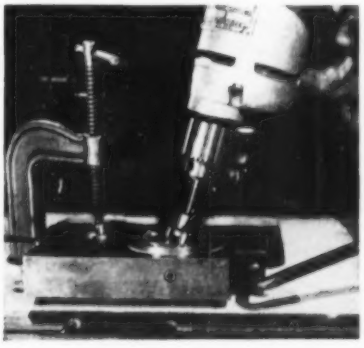
1. On-the-job training lasts 420 hr. Half of this time is spent on regular production or machine operation. The other 210 hr. are spent on special assignment designed to familiarize the trainee with the problems he will meet when he becomes a foreman.

A careful follow-up of this phase of the trainee's work is kept. A "progress record" for each trainee in his group is sent by the general foreman to the personnel department every 2 weeks.

2. **Classroom training** and training in the service departments lasts another 420 hr. GM believes in giving trainees diversified training. The trainee gets a solid grounding in human relations as well as company policies and background. He also gets at least a working knowledge of the function and importance of the staff departments he will be working with as a foreman.

In addition, all superintendents explain to the trainees the function of their departments. To insure practical application in production, local case examples are used. In some subjects, plant specialists conduct the conferences.

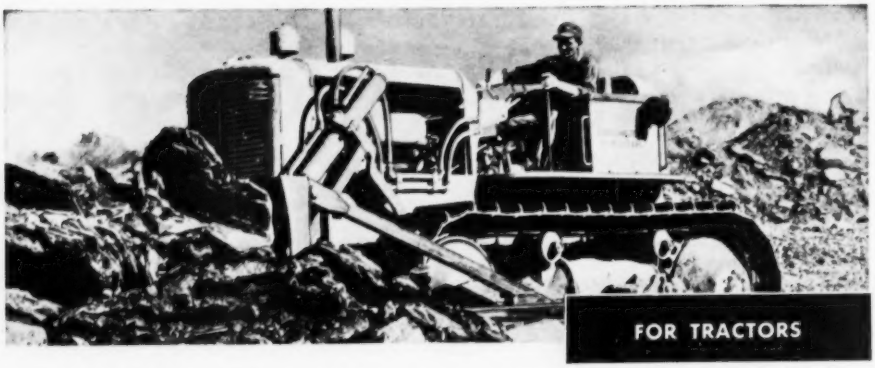
Responsibility for training lies in the department in which the trainee is assigned. The department's general foreman or supervisor takes the initiative. This applies to both the classroom and service-department trajning and on-the-job training. — Factory, April, p134



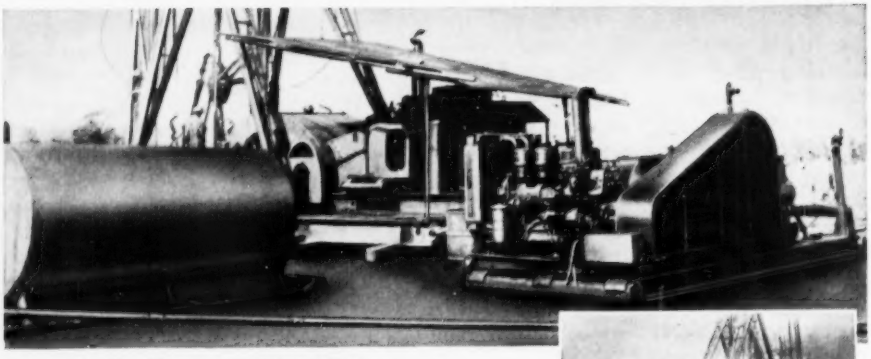
Angle Drilling Jig

A new ball-and-socket drill block now makes angle drilling fast and easy at the Temco Aircraft Corp., Dallas, Texas. The jig consists of a block of 3¼ x 6½-in. tool steel, 1¼ in. thick. The block is center-bored for a 1-in. bushing and is slotted from one side to the centerhole, permitting free movement of the ball-and-socket joint. —Aviation Wk, Feb 15, p37

Lighter more compact DIESEL ENGINES



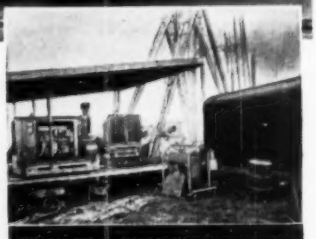
FOR TRACTORS



for any job from 32 HP. up!

They're ready to take on *any* heavy-duty job, and get more work done at lower cost than any other Diesel or gasoline engine. Don't let the small size of GM Diesel engines fool you.

When it comes to *pulling power* – and that means *paying power* in tractors, tugs, trucks and tillers – the GM Diesel is in a class by itself. It produces more power from less fuel, and outpulls and outworks even bigger, heavier machines! *Drilling Contractors* have found that GM Diesels enable faster drilling, and solve the problem of rapid, low-cost moving.



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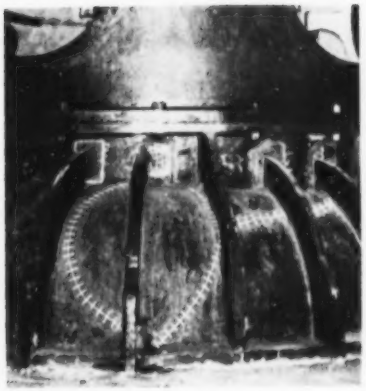
CRANKSHAFT of diesel engine is put back into service after repairs.

STEAM-ENGINE frame broken away from the cylinder is strengthened.



WATER TURBINE scroll-casing is repaired by 12 steel ribs.

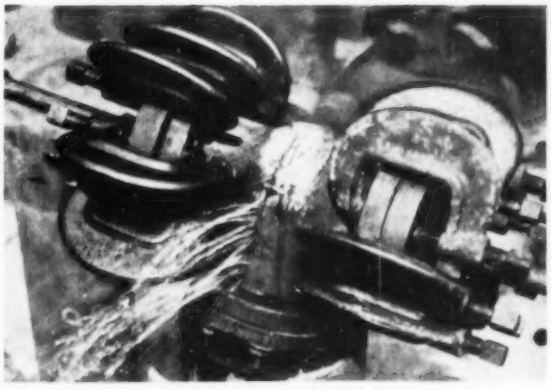
Method Saves Machinery

IF YOU ARE FACED with a broken casting, here's a method that can quickly fix it. Metalock Repair Service owns the patent on the process.

It is called Metalock. Basically, Metalock consists of cold repairing of cracked, broken, or weakened parts with metal keys made of special alloys. Size and number of keys varies with strength needed.

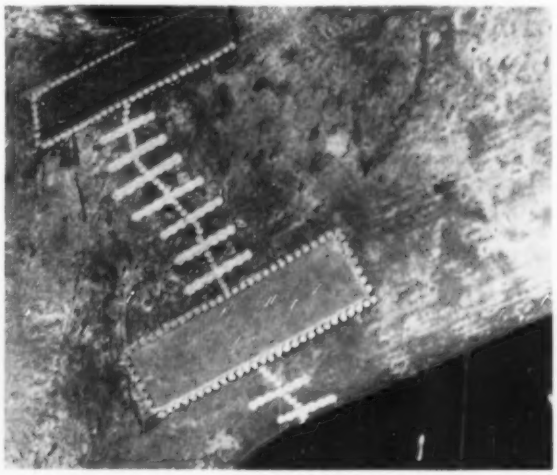
Inlays of high-strength alloy plate are held in place by dowels and cold-worked into matching half-holes between the parent metal and the lock. They reinforce points of high-stress concentration.

Metal lace is a method of sealing cracks against leakage. Holes are drilled and tapped and special studs or dowels inserted tangentially to each other along the line of fracture. Studs are cold-worked to insure complete filling and tightness of crack with new metal.—Power, April, p111

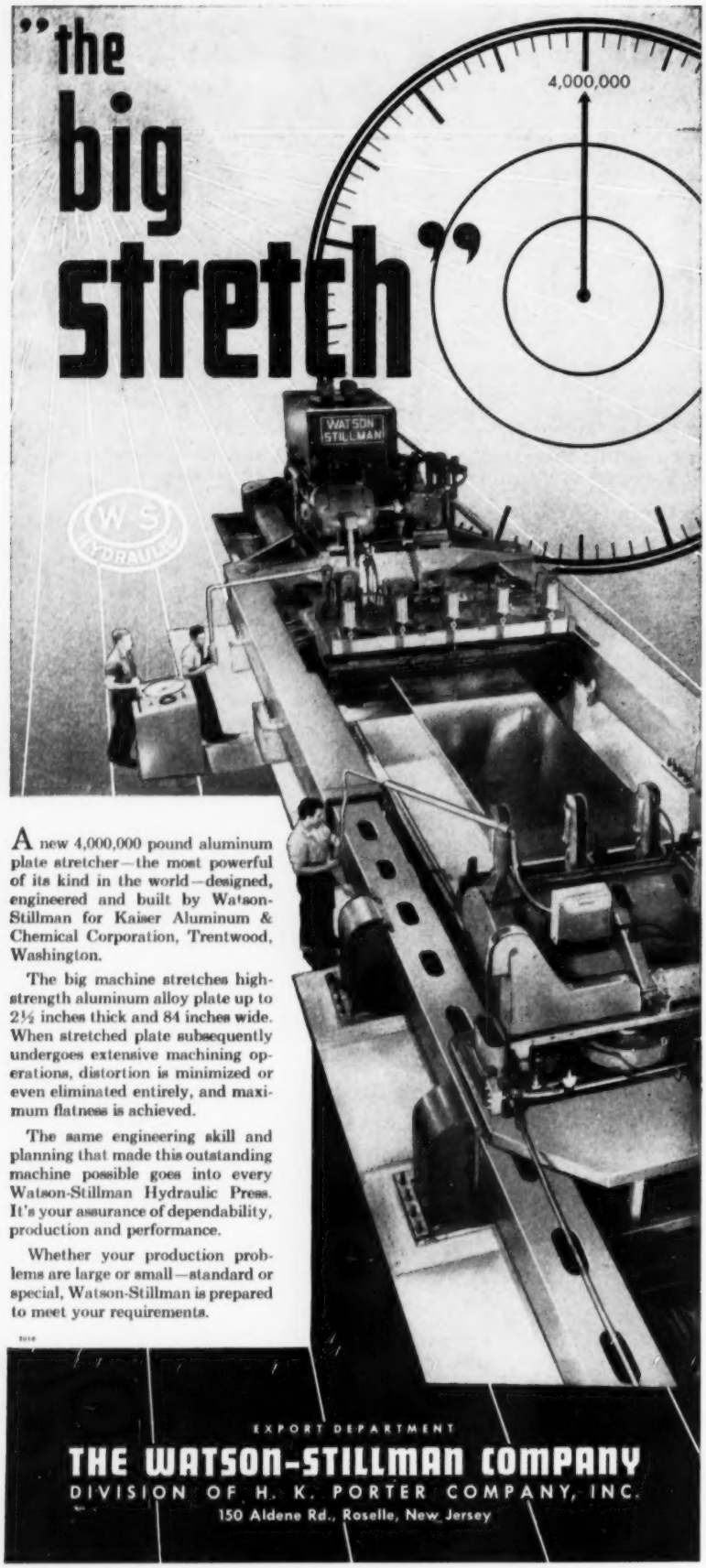


TESTING STRENGTH of repaired body of 200-lb-per-sq.-in. valve is shown. Casting cracked at 2,250 lb.

BEFORE—One of the giant spokes of this ammonia compressor is badly cracked near the hub.



AFTER—Master locks, metal locks, and metal lace repaired the cracks. Now flywheel is as good as new.



A new 4,000,000 pound aluminum plate stretcher—the most powerful of its kind in the world—designed, engineered and built by Watson-Stillman for Kaiser Aluminum & Chemical Corporation, Trentwood, Washington.

The big machine stretches high-strength aluminum alloy plate up to 2½ inches thick and 84 inches wide. When stretched plate subsequently undergoes extensive machining operations, distortion is minimized or even eliminated entirely, and maximum flatness is achieved.

The same engineering skill and planning that made this outstanding machine possible goes into every Watson-Stillman Hydraulic Press. It's your assurance of dependability, production and performance.

Whether your production problems are large or small—standard or special, Watson-Stillman is prepared to meet your requirements.

EXPORT DEPARTMENT
THE WATSON-STILLMAN COMPANY
DIVISION OF H. K. PORTER COMPANY, INC.
150 Aldene Rd., Roselle, New Jersey

Raincoat for Most Fibers Is Strong Textile Trend

Water repellents for textiles are being promoted vigorously by their makers. Dow Corning Corp. has even started a morning television program aimed at housewives to tell the story of their use for raincoats, draperies, car upholstery, and other textile products.

The textile trade is watching closely the silicone water repellents. Dow Corning and General Electric are the big suppliers of silicones. Dow Corning also markets three emulsion-type silicone repellents and is working on an emulsion that will be applicable to wool.

Other types of water repellents now control most of the market. Cravenette, an old timer, is not just one product; it has different products for different fabrics, but all are essentially wax emulsions and silicones. Du Pont's Zelan, a durable type of repellent, has a big share of the market; it is a pyridinium resin.

American Cyanamid has four repellents—two durables, Permel Finish and Permel Plus Finish, and two nondurables called Paramul. Nondurables must be renewed by laundries or cleaners. While they have a bigger share of the market at present, the trend seems to be toward the durable repellents.—Chem Wk, Mar 6, p58

Fork Truck Sets Trusses

It took only 5 hr. for a Clark Equipment Co. truck to erect 26 roof trusses for Moorman Mfg. Co.'s new two-story cafeteria and stockroom. A steeply pitched site plus a 20x30-ft. entrance extension on one side of the 50x130-ft. building made crane access nearly impossible.

The all-welded trusses (50 ft. long, 26 to 32 in. deep, and weighing 1,900 lb.) were stock-piled near one end of the building. A crane with a 40-ft. boom transferred a truss to the lift truck waiting at the end of the second floor. Then the truck moved down the floor to place the unit on its wall plates. Men walking the wall helped balance and guide the truss during this operation.—Const Meth & Equip, Mar, p73

It takes a world of products to make a ton of Bethlehem steel. In fact, Bethlehem is a customer of *41 countries* around the globe.

In this world market, Bethlehem buys chrome, tin, tungsten, manganese, fluorspar, hemp, rubber, paper pulp and chemicals – to go into the steel itself or to be used in plant operations.

Buying so much abroad, Bethlehem is a factor in the economy of many countries – and, in turn, adds to each country's industrial strength by supplying needed steel products.

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14 Mining Problems Today

How Many Apply to Your Business?

"Low-Cost Production"
"Mining Thin Coal Efficiently"
"Continuous-Mining Plans"
"Better Stripper Performance"
"Getting Men To Work Better"
"Preventing Machine Breakdowns"
"Motor Burnouts"
"Cable Failures"
"Effective Supervision"
"Better Roof Support"
"Promoting Safety"
"Educating Workers in Safety"
"Supply Handling"
"How To Train"

What You Can Do To Solve Them

"WHAT ARE THE THINGS that give you the most trouble today?" That's one of the questions *Coal Age* has been asking its readers for the past 8 months. The major problems and their solutions, as its readers told *Coal Age*, are discussed here. Not only coal men but equipment dealers, material suppliers, unions, and the host of other groups should find them interesting.

1. Low-Cost Production — The machine is the main answer to getting low-cost production. But machines are not the entire answer. Management's aim should be operating the machines at as near rated capacity as possible for the maximum length of time per shift.

The answer to increasing machine productivity lies in the thorough study of the operation. Time study is an accepted tool for this purpose and it can provide facts on which production rates can be set. With these rates it becomes easy to pick out the units that are not producing and find out why. Then logical remedies can be applied. Careful study also applies to the operations back of the face.

2. Mining Thin Coal Efficiently —Thin-seam mining seldom can be as efficient as mining in thicker coal. But new equipment now available is cutting the differential. New equipment includes low-type continuous miners that are making a good showing in coal down to 40 in. thick.

Until more new machines are developed, the thin-coal operator must be prepared to do more cutting, more timbering, more development, and more of many other things for the same tonnage. Ways and means of increasing efficiency in all such operations include:

- Use of self-loading conveyors.
- Use of equipment that is easy to move and place.
- Revision of the mining plan to increase to the maximum the volume of room work per foot of entry.
- Arrangement of development work to make it as nearly like room work as possible.
- Mechanization of rock work.
- Deeper cutting to reduce face-preparations labor and explosives requirements, and raise tons per fall.

3. Continuous-Mining Plans— The type of machine generally fixes mining plans for continuous-type equipment. Some designs can work in practically any standard mining setup. Others work better when they go straight ahead as much as possible with a minimum of turns.

Gas and dust must be considered to a greater extent in continuous mining than in other types. To a lesser extent, the mining plan must allow for the problems of good roof support and prompt delivery of supplies.

4. Better Stripper Performance —Stripping units form the key element in the efficiency of a stripping operation. Emphasis must be placed on preparation of the overburden.

Loose material of the proper size for the dipper or bucket being used can mean high stripping yardage. So drilling and shooting become the first line of attack.

The way the stripper is operated can make up to 10% or more difference in yardage per shift. Operation at extreme range cuts down production. Where banks are high, auxiliary equipment should knock off the peaks. Positioning the stripper and operating it to keep swing to a minimum raises the number of passes that can be made.

5. Getting Men To Work Better —If you foster interest in the job and make it easy for the man to perform, you approach the goal of getting men to work better. Show your men how their efforts result in better performance and, through this, to more working time.

Incentive is a strong stimulus to performance. Matching your crew's performance with others in the mine appeals to the competitive spirit almost no man is without. Another powerful incentive is the pat on the back for a good job.

6. Preventing Machine Breakdowns—New mining machines cost money. So it is important that these machines be kept working continuously. Systematic and thorough inspection, positive lubrication, high-quality materials,

and good power prevent equipment failures.

A well-organized preventive maintenance program that includes spare equipment reduces or minimizes on-shift failures. Operators that know their jobs keep machines running.

7. Motor Burnouts—Low voltages cause most motor burnouts. But continued overloading and faulty lubrication contribute their share.

The rule should be rated voltage at the machine terminals at all times. It will also help keep machine speed up to the designed rate.

Keep motors clean, and keep ventilating openings clear. Make sure that faulty lubrication does not result in armature drop.

8. Cable Failures—Good voltage at the face can prevent a great deal of cable trouble by preventing heating as a result of excess current flow. Adequate substation capacity near the load centers, with both positive and negative conductors of the proper size, can help maintain proper voltage. Most cables fail for one or more of the following reasons: excessive tension, mechanical damage, current overload, poor splicing, and poor terminal technique.

9. Effective Supervision — Top management is concerned with the quality and effectiveness of mine supervisors. Mine supervisors are concerned with their standing in the managerial hierarchy and with methods of improving their ability.

Management should treat foremen as management men and make certain that every opportunity is taken to give foremen stature with their men. Work with and through them, with no by-passing or failure to back them up. Provide the privileges and prerequisites that go with being a foreman, as well as the men and the tools they need to do their job.

10. Better Roof Support—How well the roof is controlled governs to a large extent the success or failure of a mine, aside from its effect on injuries and fatalities. The most modern of equipment is of little value if it cannot be used effectively. Strict adherence to a standard procedure, whether it be with roof-bolting or conventional timbering, can prevent accidents from roof falls.

11. Promoting Safety—Promoting safety must start in the top office. It continues and flourishes if there is dedication all the way down.

It brings in everybody—officials, miners, unions, wives, children, neighbors, newspapers, merchants, and school teachers. It boosts safety not only on the job but also at home, at school, and on the streets and highways. And it uses all communication channels.

12. Educating Workers in Safety—Personal interest and conviction are the foundation of safety. A man that is conscious of the need for safety is convinced of its benefits to him, and is trained in accident prevention is a man that works safely and wants things safe around him.

Training is the key. Training takes in men and officials completely. And it means intensive team work between companies and miners, unions, and all agencies involved in coal mining.

13. Supply Handling—Supplies must be used wisely. It is false economy to make a general reduction in the quantity of materials issued from the supply house. Much more can be gained by careful distribution.

Standardization of pumps, motors, and types of mining equipment permits reduction of inventory. One spare part can serve many units.

Special timber cars that allow timbers to be handled easily or in palletized units, preassembled roof bolts, and special lubrication cars, all are tools that help reduce supply handling costs. Supply cost can be cut by application of long-lived materials.

14. How To Train—The goal in training is improvement of the company position by making miners or management or both more proficient. Perhaps the first consideration in setting up a training plan is making sure that the men that take it get something definite out of it. If you can keep their self-interest before your prospective trainees, you will have solved one of your toughest problems—the support and participation of workers.—Coal Age, April, p70

Fast Handling . . .

. . . in chemical plant is paying off handsomely and profitably in time, manpower, and money

THREE YEARS AGO, U. S. Metals Refining Co., saddled with a 50-year old plant, had to cut production costs. It turned to better, faster materials handling.

The plant, spread over 185 acres, was supplied principally by standard- and narrow-gage railway. The system lacked flexibility. Moving materials from spot to spot was a slow job with far too much handling by hand.

The first step was to substitute more mobile trucks and fork trucks for the narrow-gage track. This meant: paving roads, raising and widening doorways, palletizing materials, building loading ramps, and installing two-way radios for rapid dispatching.

To get maximum results from the trucks, they are kept rolling 60 min. of every working hour. The old unwritten law that fork trucks should travel only 5 miles per hr. was disregarded; now they operate as fast as safety permits. And there have been no accidents in 3 years.

To speed up operation still more, motor-operated, radio-actuated doors were installed on plant buildings. A transmitter in each cab can open a door 90 ft. away.

New and secondary uses for trucks were uncovered. Truck operators now report broken pipes, damaged power lines, and other dangers. Trucks also double as fire engines.

Here are some helpful rules that the company recommends for anyone establishing a fork-truck operation:

- Use time, not distance, to measure how well a truck is used.
- Layout storage areas so trucks can carry loads in both directions.
- Make operators' job attractive and you get more material moved.
- Have more equipment than operators and keep it on a strict maintenance schedule.—Chem Wk, Apr 10, p48

From Jungle To World Port

Only 2 years were needed to transform Puerto Ordaz, Venezuela, from a jungle into a port that will ship 2-million tons of iron ore this year. The first ore went to the U. S. in January. It is carried from Orinoco Mining Co.'s (U. S. Steel) Cerro Bolivar mine (McG-H Digest, Feb, p32) to Puerto Ordaz by rail. There it is crushed in primary and secondary crushers and stocked by a 400-ft. belt conveyor bridge. Rotary plows beneath ore pile feed a conveyor belt that carries ore to a shiploader. Link-Belt Co. furnished the equipment as prime contractor. Wellman Engrg. Co. built car dumper, conveyor bridge, and shiploader.

Large-Tonnage Oxygen for Copper Smelting

An oxygen unit is now producing vast quantities of oxygen required for direct flash smelting of copper concentrates. Built by Canadian Liquid Air Co. for International Nickel of Canada, the new Oxyton separates oxygen from atmospheric air by the liquefication process.

International Nickel's operations call for 7½-million cu.ft. of oxygen every day—enough to fill 32,000 standard cylinders. To handle this demand, Oxyton produces 300 tons of 95% pure oxygen every 24 hr.

The new flash smelting process eliminates the fuel normally required for smelting and makes economical the present large-scale output of liquid sulfur dioxide from furnace exhaust gas.

Leading research scientists have become aware of the far-reaching possibilities of large-scale oxygen applications in metallurgical and chemical industries. Their studies lead to the conclusion that oxygen, employed in tonnage volumes, will transform present industrial processes within a generation.—Power, Mar, p150

Oil Exploration Tools

Two new ideas will help the geologist find oil. One is the Geograph method, developed by McCollum Exploration Co., Houston, Texas. A 6,000-lb. weight is dropped to the ground from a special truck. A recorder takes soundings and gives a clear picture of the structure being mapped.

The second method is continuous velocity logging, developed by Magnolia Petroleum Co. A sonic device on a conventional well-logging cable gives a continuous record throughout a well bore of the velocity of sound-energy travel through subsurface formations. The device generates pulses fast enough (20 to 30 per sec.) to obtain a continuous record.—Oil & Gas J, Mar 22, p107; Mar 29, p61

Bonus Plan Helps Firm Control Absenteeism

Farmers Casualty Co., Des Moines, Iowa, has figured out a way to keep absenteeism, tardiness, and personnel turnover to a minimum. At the same time it raises office efficiency and morale to a high level.

Here's what the company does: every girl who has 100% attendance during the year gets a bonus equivalent to 12 days' pay. For every day that she does not come to work, a day's pay is deducted from the bonus. Also, if she comes in 15 min. or 30 min. late without an excuse, an appropriate amount is deducted from the bonus.

Girls work only 35 hr. a week in an air-conditioned office. According to the firm, the girls accomplish more in a 7-hr. day than any office force of a similar size working an 8-hr. day.—Am Business, Mar, p30

Hot Radiography Process Saves Welding Time

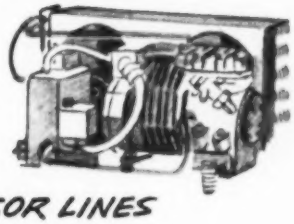
Radiographic inspection for flaws at progressive stages in welding pipe joints often avoids removing an entire joint weld. But the ordinary technique wastes time and labor during inspection. The weld must be cooled before taking the radiograph. Long post-heating to relieve internal stresses must be carried out before controlled cooling begins. After radiographing of the cool weld, many hours of preheating are necessary before welding can be resumed.

A new process, the McElroy-McNutt process, permits radiography without cooling. A watercooled jacket consisting of two hollow cylindrical sections protects the film from high temperatures.

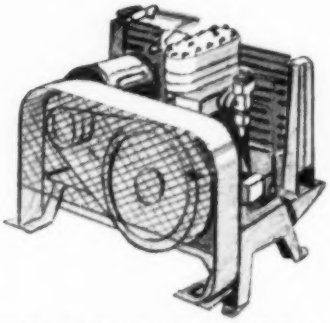
The cooling jacket increases the distance between source and film by about ½ in. Two thin sections of steel and a layer of water must be penetrated by the radiation. These have had no effect.

For a typical joint in 3-in. thick 17-in. OD chromium-molybdenum steel pipe, hot radiography cuts total welding time 94½ hr.—Power, Apr, p126

FROM *the Bundy Sketchbook*
TO *jog a designer's imagination*

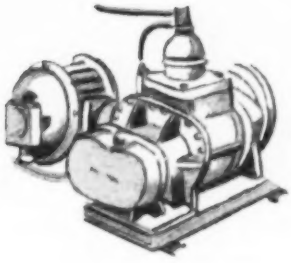


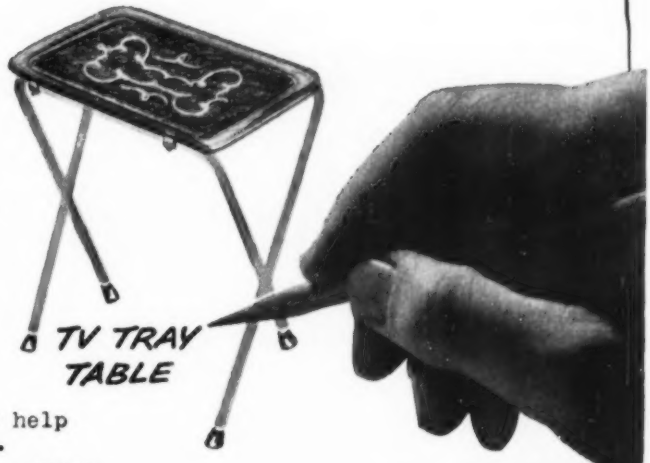
COMPRESSOR LINES



SERPENTINE COILS IN CONDENSER UNIT

VACUUM PUMP LINES





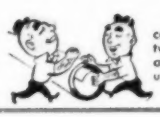
TV TRAY TABLE

REMARKS Is that cost-saving idea wasting away in a notebook? Then why not let expert Bundy engineers help bridge the gap between idea and finished product. They offer you specialized engineering skills, unmatched fabrication facilities, plus the priceless extra of Bundyweld, the only tubing double-walled from a single strip (see below).

WRITE today for catalog for help in developing your tubing ideas.
BUNDY TUBING COMPANY, DETROIT 14, MICH.

WHY BUNDYWELD IS BETTER TUBING

Bundyweld starts as a single strip of copper-coated steel. Then it's . . .



continuously rolled twice around laterally into a tube of uniform thickness,

and passed through a furnace. Copper coating fuses with steel. Result . . .

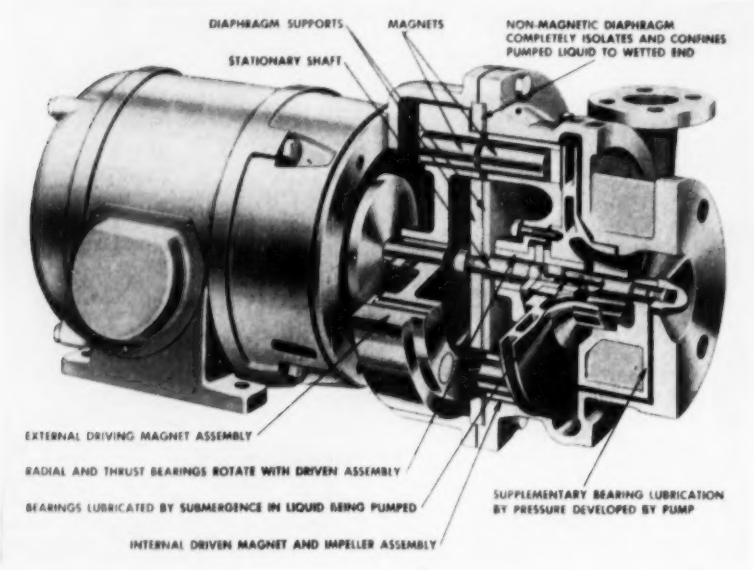
Bundyweld, double-walled and brazed through 360° of wall contact.

BUNDYWELD TUBING®

DOUBLE-WALLED FROM A SINGLE STRIP

- Leakproof
- High thermal conductivity
- High bursting point
- High endurance limit
- Extra-strong
- Shock-resistant
- Ductile
- Lightweight
- Machines easily
- Takes plastic coating
- Takes plating
- Bright and clean
- No inside bead
- Uniform I.D., O.D.

NEW PRODUCTS


DIAPHRAGM SUPPORTS
MAGNETS
NON-MAGNETIC DIAPHRAGM COMPLETELY ISOLATES AND CONFINES PUMPED LIQUID TO WETTED END
STATIONARY SHAFT
EXTERNAL DRIVING MAGNET ASSEMBLY
RADIAL AND THRUST BEARINGS ROTATE WITH DRIVEN ASSEMBLY
BEARINGS LUBRICATED BY SUBMERGENCE IN LIQUID BEING PUMPED
SUPPLEMENTARY BEARING LUBRICATION BY PRESSURE DEVELOPED BY PUMP
INTERNAL DRIVEN MAGNET AND IMPELLER ASSEMBLY

New Magnetic-Drive Pump Eliminates Packing; Handles Corrosive Liquids

Complete isolation and confinement to the wetted end is provided for liquids being handled in a new magnetic-drive, horizontal centrifugal pump. The unit has no rotating seals, no packing, and no rotating member between the driver and the driven section. Power is transmitted by means of matching magnetic fields from adjacent opposite poles mounted around the periphery of the driving and driven elements.

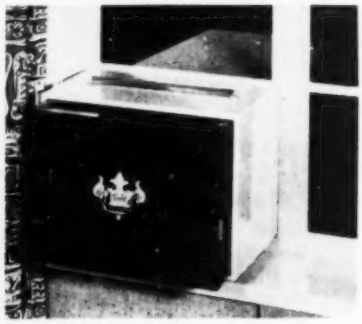
A circular disk, with 12 to 24 permanent magnets (depending upon pump size), is attached to the rotary motor shaft. This drives a similar size permanent disk magnet and impeller unit, which is attached to and rotates around a stationary shaft in the liquid end. A non-magnetic diaphragm separates the two ends.

At present, the pump can be powered by motors with ratings of 1, 1½, and 2 hp. Motor can be of standard, totally enclosed or explosion-proof design. Pump size is 1x2½x8 in. Maximum capacity is 15 gal. per min.

Materials of construction have been stainless steel, bronze-fitted cast iron, and all bronze. Almost any material can be furnished as long as a non-magnetic diaphragm can be used. Limitations of applications are set by the maximum power of 2 hp., and by the non-handling of abrasive liquids, because pump bearings are lubricated by the liquid passing through the pumps. —**Export Dept., Peerless Pump Div., Food Machinery & Chemical Corp., 301 West Ave. 26, Los Angeles 31, Calif.**

Sound-Absorbing Units

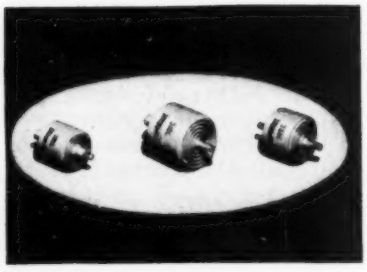
New sound-absorbing units for industrial applications feature small size, ease of installation, lightweight, and economy. Units consist of inner cores in perforated stucco-embossed aluminum. Units may be clustered or honey-combed in layers over source of sound. They do not interfere with sprinkling or lighting equipment.—**Sonosorber Corp., 21 S. 16th St., E. Orange, N. J.**



Room Air Conditioner

New drawer-type room air conditioner fits casement, standard and many special-type windows. There are no controls for operating the unit. Pulling out the front panel —like opening a drawer—provides three positions for differing degrees of ventilation and cooling.

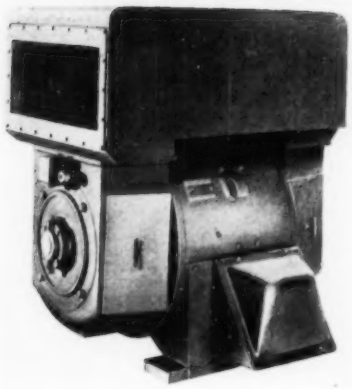
A full-width filter removes dust and pollen from the air. Two models are available—½ and 1/3 hp.—**Servel Inc., 20 Pine St., New York 5, N. Y.**



Filter Capacitors

New molded ceramic high-voltage filter capacitors should be useful in the filter circuits of modern television receivers and cathode-ray instruments. The capacitors, molded in moisture-resistant, non-inflammable thermosetting plastic, are available with 15 different terminal combinations to meet practically all mounting needs.

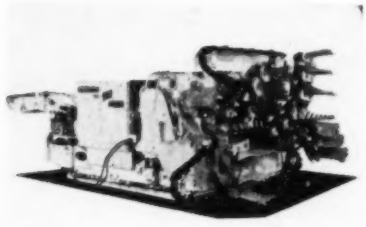
Maximum operating temperature is 85°C. Minimum insulation resistance under standard test procedures at 25°C is 10,000 megohms. —**Sprague Electric Co., 35 Marshall St., North Adams, Mass.**



Unit-Cooled D-c. Motor

Totally enclosed direct-current motor for use in severe atmospheres is available in ratings from 15 to 200 hp. Ventilation is independent of motor speed. One blower forces cooling air through external passages, while a second blower forces internal air through closed internal passages of the air cooler.

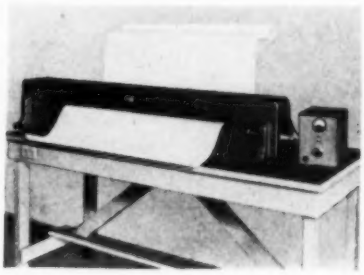
The blower controller consists of a magnetic switch that can be interlocked with the main controller. A thermostatic relay protects the main motor in case of blower-motor failure.—**International General Electric, 570 Lexington Ave., New York 22, N. Y.**



Mines 7 Tons per Min.

New continuous-type mining machine of the boring type produces 7 tons of coal per minute. It has a fixed cutting height of 7 ft. and feeds into the seam by traction of its treads, cutting and breaking out the coal with twin rotating units and a cutter chain. Dislodged coal is pushed to the center of the path by the rotating units and bulldozed onto the machine's chain conveyor.

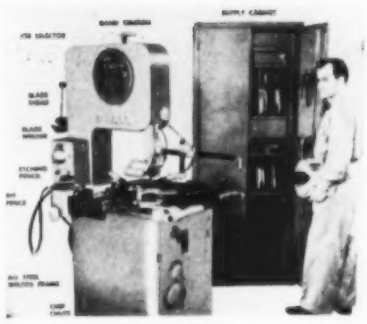
The Type 500 Miner makes an oval cut measuring 7 ft. high by 13 ft. 2 in. wide at its centers, arched on both sides and at the top corners for strong roof support. The bottom is cut out at each side and completely cleaned for a wide, flat roadway.—**Goodman Mfg. Co., Halstead St. & 48th Pl., Chicago 9, Ill.**



Detects Metal in Textiles

New electronic metal detector permits continuous inspection of textiles. It indicates the presence of magnetic, nonmagnetic, ferrous, and nonferrous metals, and it will inspect materials moving at speeds from 25 to 1,000 ft. per min.

As the material passes through the aperture, tramp metal will distort a magnetic field and create a signal in the coil circuit. Controls can be set to stop a conveyor, light a warning light, sound a horn, spray mark the contaminated area.—**RCA International Div., Radio Corp. of America, 30 Rockefeller Plaza, N. Y. 20, N. Y.**



Versatile Band Saws

New line of 16-in. band sawing machines have 12-in. thickness capacity on metal, wood, plastics, and many other materials. Machines are easily arranged for band filing, metal polishing, and carbide finishing by use of proper bands, tool guides, and attachments. Speeds, either fixed or variable, range from 50 to 5,200 ft. per min.—**DoAll Co., Des Plaines, Ill.**

Aluminum Pipe Insulation

Foamglas pipe covering is now available with an aluminum jacket. Advantages: saves costly installation steps and gives moisture- and weather-proof jacket.

Covering comes in six thicknesses for pipe sizes up to 14-in. dia.—**Pittsburgh Corning Corp., 1 Gateway Center, Pittsburgh 22, Pa.**

New Coupe Adds Versatility

A coupe express-type vehicle, utilizing the basic Plymouth, Dodge Kingsway, and De Soto Diplomat business coupes, is being manufactured for overseas distribution. Equipped with a commodious pick-up express body, the vehicle combines passenger functions with capacity for light merchandise.—Chrysler Export Corp., 341 Massachusetts Ave., Detroit, Mich.

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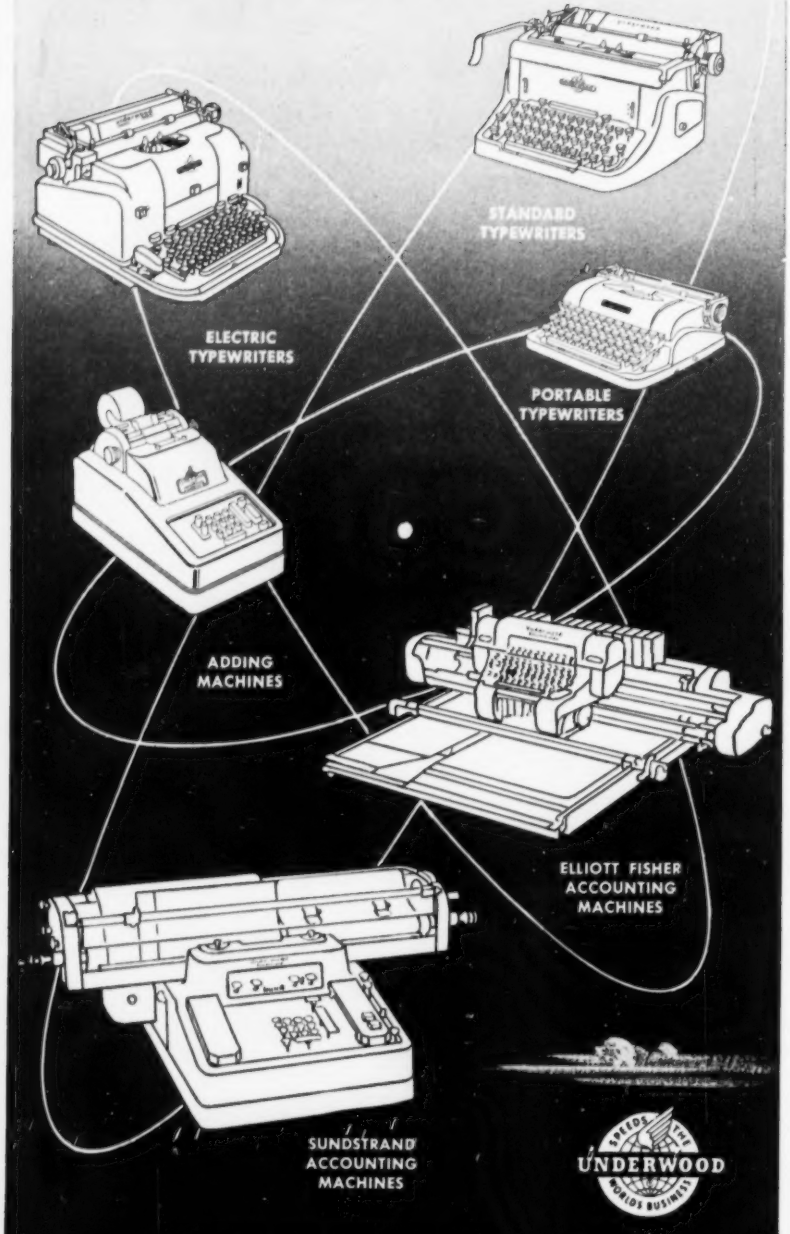

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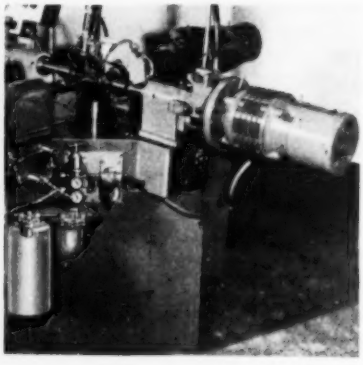
Safe Electric Fork Truck

New fork truck is safe to use in hazardous areas. These include such atmospheres as those containing gasoline, naphtha, benzene, solvents, and other explosive vapors.

Safety features are a totally enclosed explosion-proof panel, static-conductive cushion tires, explosion-proof spark plugs, and the switch incorporated with the battery. The switch both closes the circuit and locks the plug and receptacle together.—**Clark Equipment Co., Battle Creek 73, Mich.**



Spray Lubricates Tool

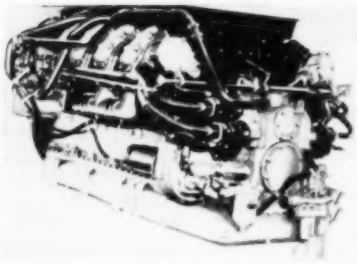
New Spray-Lube system provides efficient utilization of cutting oils and drawing compounds. Cutting feeds and speeds may be increased with prolonged tool life.

The spray can be applied to work area from any required direction and to as many points as necessary to cover the critical areas of contact between cutting tools and work piece. Heat withdrawal is rapid. Smaller quantities of coolants or lubricants are required.—**C. A. Norgren Co., 3421 So. Elati, Englewood, Colo.**

Powder-Actuated Tool

Super-Power Jobmaster will drive heavy shank fasteners into structural steel plates up to 1-in. thick and into hardest concrete. Pins and studs so driven have a holding power 25% greater than recorded for fasteners seated by any other heavy-duty tool.

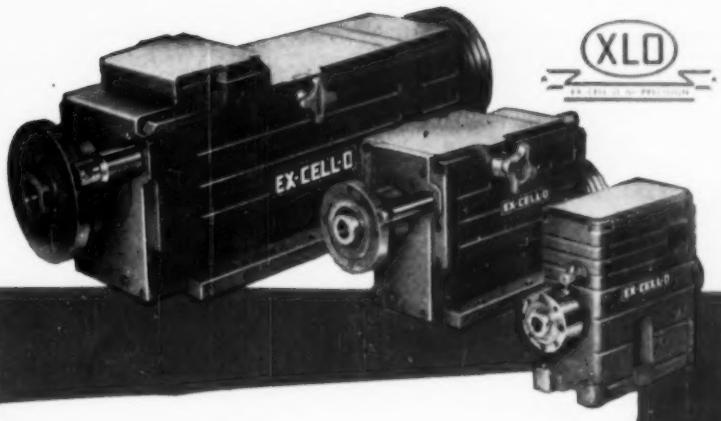
The new tool offers a choice of four powder loads for driving any of the following: five types of utility head studs, six types of externally threaded studs, and eight types of drive pins.—**Ramset Fasteners, Inc., 12117 Berea Rd., Cleveland, Ohio.**



High-Power Engines

Internal combustion engines developed for tanks and other military vehicles are now available for commercial use. Design changes have stepped power-output ceiling from 200 hp. to over 1,000 hp.

The line includes the following models: 6-cyl., 375-hp. AO-895-4; the 500-hp. supercharged version, AOS-895-3; 12-cyl., 810-hp. AV-1790-7; the 1,040-hp. supercharged version; and liquid-cooled, 12-cyl., 810-hp. LV-1790-1. All have twin ignition. Each spark plug is fired independently of others.—**Continental Motor Corp., Muskegon 82, Mich.**



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HYDRAULIC POWER UNITS

Ex-Cell-O Power Units feed or rotate tools in easily controlled automatic cycles. A single tool can be held in the unit spindle or a multiple head can be bolted to the quill flange. The Units are used in low-cost, high-production machines for such operations as drilling, reaming, counterboring and spotfacing. A typical machine consists essentially of a plain base, a work-holding fixture and one or more power units.

Ex-Cell-O Units are self-contained and compact; can be mounted horizontally, vertically with the spindle nose down, or at any angle between these positions.

Ex-Cell-O styles 28-A, 21, and 20 Quill-Type Hydraulic Power Units are shown above. They are standard models. Send for *all* the facts about them. Write or cable Ex-Cell-O for Bulletin 45828.

53-34

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NEW PRODUCT BRIEFS

Foam-backed Fabric—Continuous-process system for producing foam-backed fabrics is being licensed. Soft foam is produced continuously and cured directly onto natural or synthetic textiles. — **Elastomer Chemical Corp., 212 Wright St., Newark 5, N. J.**

Low-temperature Cure Resin—Laminac 4110 is a low-viscosity type resin designed for low-temperature curing applications. It is not affected by air exposure during its cure.—**American Cyanamid Co., 30 Rockerfeller Plaza, New York 20, N. Y.**

Nail Hammer—New hammer, No. 51½N, is designed to add 10 in. to reach of user when starting a nail in out-of-reach places. Double-duty claw pulls and holds. Nail seats snugly in slot on head of hammer. —**Stanley Works, 100 Lafayette St., New York, N. Y.**

Wet Blasting—Machine automatically finishes plastic pieces by means of wet blasting. Operator loads and unloads work table. Table rotates through three chambers: (1) blast chamber, (2) rinse chamber, (3) air-drying chamber. —**Cro-Plate Co., Inc., 747 Windsor St., Hartford, Conn.**

Apron Feeders—Extra heavy-duty 9-in. pitch apron feeder is available in 36, 42, 48, and 60-in. width. Manganese flights are optional. Special features promise longer life, smoother operation, and easier maintenance. — **Universal Eng'rg. Corp., Cedar Rapids, Ia.**

Diesel Engines—Complete line of two-cycle diesels with two, three, four and six cylinders is offered in power ratings of 58 to 255 hp. Redesign has raised power 36%. Operating speed is 1,800 rpm. Compression ratio is 16 to 1.—**Harnischfeger Corp., Milwaukee, Wis.**

Welder-Power Plant — Combination alternating-current welder and power plant will be particularly useful to contractors and others needing 110- or 220-v. power for other purposes. Welder capacity is 200 amp.—**Hobart Brothers Co., Troy, Ohio.**

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For unloading, warehousing and shipping its extensive and varied stock of grocery items, food specialties and liquors, Mateo Brunet S.A.C. uses two Clark 3000-lb. fork trucks—and accomplishes big direct savings. This company is one of Uruguay's oldest and most important wholesale and importing firms.

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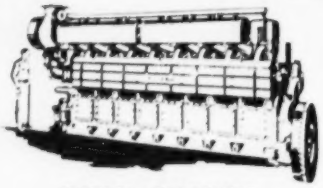

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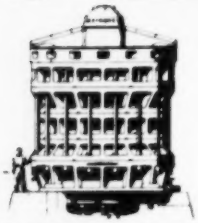
2 and 4-cycle types, for fuel oil, Duafuel and natural gas operation —from 10 to over 10,000 H.P.



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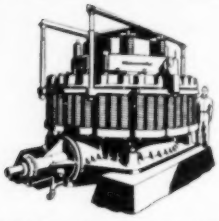
for heavy duty crushing of ores and industrial minerals.



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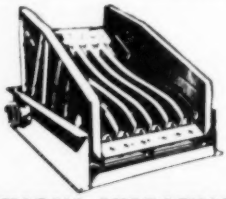

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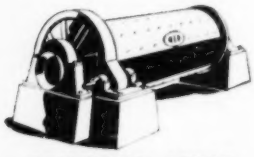
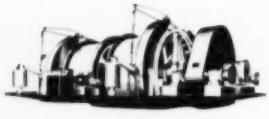
for all types of wet and dry screening, from scalping on through the finer separations.



GRINDING MILLS

and other Machinery for basic processing of ores and minerals.



MINE HOISTS

in types for hauling both ore and men, in large coal and metal mining operations.

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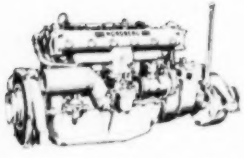

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from 95 to 150 H.P. for fish boats, tugs, and pleasure craft.

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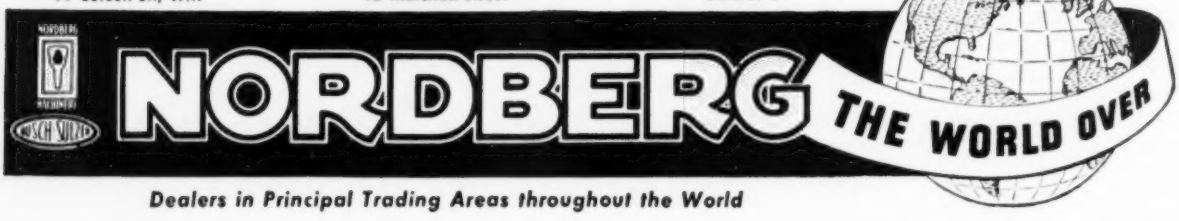

Dealers in Principal Trading Areas throughout the World

MANAGEMENT REPORT

Greater use of facsimile reproduction can cut your clerical staff's workload and free them for other duty. Instead of typing copies of the original and then checking the copies, new machines will make as many copies as you need. Data, signatures and even drawings can be reproduced.

One company uses facsimile reproduction in making working copies of budget authorizations showing all signatures and approvals. Another company reproduces contracts. Actually, possibilities are unlimited.—Am Business, Mar, p18

Almost every company encourages workers to report accident hazards. But is that enough? Recent publications of both the National Safety Council and the American Institute for Research suggest it is not. A near accident may not appear to result from a potentially recurring source of danger—until a qualified person examines all the facts. But these near accidents are seldom reported. The conditions go uncorrected until a real accident occurs.

Repeated near accidents at the same place are certain signs of coming trouble. A reporting system giving at least this much analysis would pay.

AIR says that more reports, and more comprehensive reports, are filed if they do not move through regular channels, but instead go to some impartial or independent group. In industry, that would be a safety engineer, committee, or the personnel department.—Factory, April, p124

Business executives everywhere, particularly in countries where power is a problem, should watch the U. S. peace-time atomic-energy program closely—and include it in their long-term thinking and planning. The civilian side of the program is aimed at creating nuclear power plants that are economically feasible and competitive.

A formal plan of the Atomic Energy Commission now covers studies for the next 5 years. AEC will build five different-type reactors to study their characteristics. The Commission is also encouraging research and active participation by private companies and universities. Competitive atomic power looks a lot closer now than most had predicted for it. The first U. S. central-station nuclear power plant will be built in Pittsburgh by Duquesne Light Co. You can also expect to see the U. S. exchange information on industrial atomic power with friendly nations.

If you use or make leather, watch for a new development in leather tanning. A new process, called Secotan, is claimed to cut the usual weeks or months of conventional methods to a few minutes. A completely automatic machine is being assembled at Eagle Ottawa Leather Co.'s tannery in Grand Haven, Mich. The process, though applicable to a wide variety of hides and skins, will be first tried out on tanning, fat liquoring, and dyeing of side leathers.—Chem Wk, Mar 20, p88

High-speed machining raises personnel problems that are sometimes hard to handle. One U. S. company put in a new lathe meant to run at 2,000 ft. per min. But after a few weeks, the operator was running it at half the speeds and feeds. After this happened a couple times, the manufacturer's representative solved the problem this way: showed that it could be operated at 4,000 ft. per min. and said, "We don't want you to run it that fast. All we want you to do is run it half as fast." No more trouble.—Am Mach, Mar 29, p139

A method for measuring the advantages of one location against another, from the point of view of markets, has been developed by Chauncy D. Harris, University of Chicago. The method can be used to (1) explain why industries and plants concentrate in some areas, and (2) figure the market advantages of one location against another. It's expressed in terms of an index.

To arrive at the index for any plant location, you start with (1) the estimated size of the market, and (2) the distance between the plant and each of the market areas. Harris uses total retail sales, broken down by areas, as the basis for estimating size of the over-all national and regional markets. As a measure of distance, he uses cost of transportation per ton between any two points.

First, estimate the size of the market for your product in each of the market areas you expect to serve. Then get the distance to each area in terms of transport cost per unit of product. Dividing the market figure for each area by the distance figure gives you the area index. And finally, add up the area indexes to get your regional market potential for your plant location. If you are comparing possible locations, the one that comes out with the highest index is best from a market standpoint—if transportation cost is a minor factor.

If transportation is a major factor, you want a location that will give you the lowest possible transport costs. In this case you multiply the two figures for each market, instead of dividing. Area indexes are added as before. But in your comparison of locations, it is the one with the lowest index that is best.—Business Wk. Apr. 3, p61

PRODUCTION IDEAS

from Manufacturers' Catalogs

Diesel Engines—Booklet "The Dependable Diesel" shows diesel engines at work in a wide variety of applications.—Cummins Engine Co., Columbus, Ind.

Equipment for Radiography—Catalog describes complete range of equipment necessary for gamma radiography of machine components using radioactive isotopes.—Panta (Instruments) Ltd., 26 Savage Gardens, London E.C. 3, England.

Diesel Generators—Booklet Ex2156e contains complete information on the smallest to the largest generators for diesel power stations. Essential features of principal cooling systems are covered—A.E.G. Allgemeine Elektricitäts-Gesellschaft, Berlin, Germany.

Automotive Asbestos Products—Catalog A-53 contains brake lining and clutch facing data for practically all passenger cars, trucks, buses, and trailers. Catalog includes a special section on foreign cars.—Thermoid Co., Trenton, N. J.

Cable and Wire Testing—The new multiple cable and wire tester for prestretching and proof-testing aircraft cable and other wire assemblies is described in Bulletin RE-9-53.—Riehle Testing Machines Div., American Machine & Metals, Inc., 233 Broadway, New York, N. Y.

Granite Surface Plates—Catalog No. 510 contains principal features and advantages of granite surface plates.—Taft-Pierce Mfg. Co., Woonsocket, R. I.

Seamless and Welded pipe—A new data card, TDC138A, contains information on dimensions, weights, specifications, grades and analyses of seamless and welded carbon, alloy and stainless-steel pipe.—Babcock & Wilcox Co., Beaver Falls, Pa.

Crane-drive Equipment — Bulletin GEA-5408A illustrates outstanding features of d-c crane drive equipment designed to meet varied duty-cycle requirements, from accurate spotting by machine-shop cranes to high-speed lowering by magnet cranes.—International General Electric Co., 570 Lexington Ave., New York 22, N. Y.

Resistance-thermometer Bulbs—Catalog 5701 describes resistance thermometer bulbs of high-speed, marine, room-temperature and sanitary types, for temperature spans as narrow as 20°F.—Minneapolis-Honeywell Regulator Co., International Div., 2747 Fourth Ave., Minneapolis 8, Minn.

Apron Conveyors—Folder 2470 describes piano-hinged apron conveyors in three pan types, four chain pitches, and four basic assemblies.—Link Belt Co., 2680 Woolworth Bldg., New York 7, N. Y.

Roasting Zinc Concentrates—Leaflet 7501 covers the application of Fluo-Solids to the roasting of zinc concentrates as demonstrated on a commercial scale.—The Dorr Company, Inc., Barry Place, Stamford, Conn.

Crane Excavators—Booklet "Handbook of Data for Proper Selection of Crane-Excavators" contains specific information on major design and construction fundamentals. — Wayne Crane Div., American Steel Dredge Co., Inc., Fort Wayne 1, Ind.

Vacuum Machines—Bulletin No. WDV 40 describes heavy-duty portable wet-and-dry vacuums, Models 115 and 155. Complete descriptions and specifications on both models are listed.—Hild Floor Machine Company, 740 West Washington Blvd., Chicago 6, Ill.

Building Insulation—Catalog FG-100 lists condensed specifications for the application of Foamglas in walls, ceilings, floors, roofs, perimeters and low-temperature space insulation.—Pittsburgh Corning Corp., 1 Gateway Center, Pittsburgh 22, Pa.

Pressure Castings—Bulletin 43 contains illustrations of specific industrial applications of Meehanite castings where specifications demand absolute density, uniformity and resistance to various pressure ranges.—Meehanite Metal Corp., 714 North Ave., New Rochelle, N. Y.

Ultrasonic Thickness Gages—The Ultrasonic Specifications Folder describes data necessary to selection of the ultrasonic thickness-measuring instrument best suited to a particular problem.—Branson Instruments Inc., 430 Fairfield Ave., Stamford, Conn.

Safety Threads and Thresholds—Catalog 54 describes complete variety of threads and metal in which they are available.—Wooster Products Inc., Dept. V 4, Wooster, Ohio

Investment Service—"Market Pointers," a highlight report prepared by the Francis I. Du Pont & Co. investment service research department, contains major articles, graphic charts and security facts, figures and forecasts.—Francis I. Du Pont & Co., One Wall St., New York 5, N. Y.

Air-quenching Coolers—Bulletin 07B-7896 contains complete information on air-quenching coolers that will help reduce your fuel and grinding costs.—Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Power Belt Conveyors—Complete information on what power belts can do is given in catalog.—Rapids-Standard Co., Inc., 310 Rapistan Bldg., Grand Rapids 2, Mich.

Filtration Equipment—New bulletin describes complete line of oil filtering and handling equipment. Complete information is given on purifiers, clarifiers, and Houdaille Purivac units.—Honan-Crane Corp., 26 Madison Ave., Lebanon, Ind.

Refrigeration and Air Conditioning—Forms 4RCP-88-300, 4RCP-88-305 and 4RCP-88-306 describe features of three new Servel air conditioners. Form 3WBP-88-304 contains complete information on the Wonderbar refrigerette's features and accessories.—Servel Inc., 20 Pine St., New York 5, N. Y.

Crawler Tractors—Catalog contains complete information on Terratracs. Specifications are given on tractors, Terradozers, Terra-"A"-Dozer, and Terraload'rs. — American Tractor Corp., Churubusco, (Fort Wayne), Ind.

Rolling Mills—Bulletin 273 describes and illustrates F rolling mills, gear drives, pinion stands and rolling mill handling equipment.—Farrel-Birmingham Company, Inc., Ansonia, Conn.

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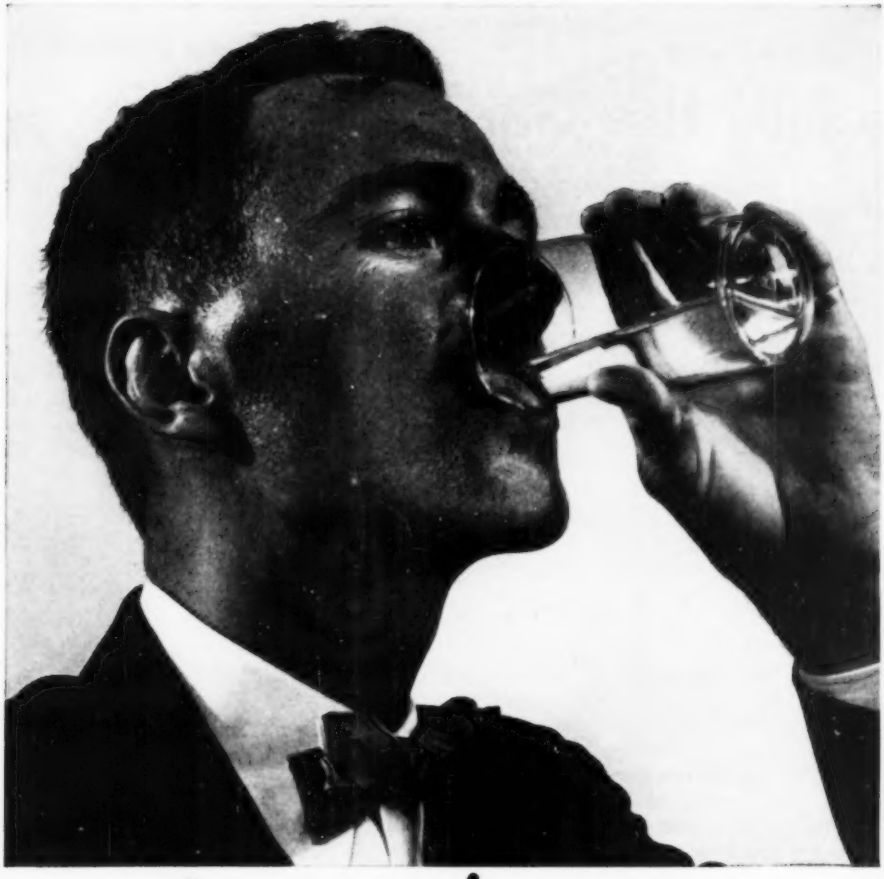
. . . to the manufacturers for the free literature announced on this page. Tell them definitely which catalog you want—specify the catalog number or its name when either one is given. And mention that you saw the offer in the McGraw-Hill Digest.



Ever taste the glass?

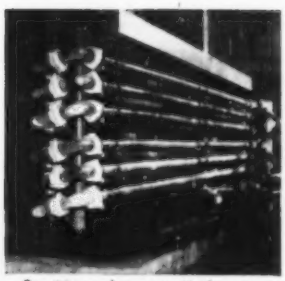
How often a glass of cold water just hits the spot!

Ever stop to think of *why the glass?* Is it because the drink looks sparkling cold and inviting through its crystal transparency? Or glass is so smooth to touch and light to pick up? Or because it's easy to clean?

These things are important, but mostly it's because your drink tastes better. The drink doesn't pick up the taste of the container. Glass is chemically stable. Non-contaminating.

That's why dairymen use glass pipelines; why processors of food, pharmaceuticals, dyes and other sensitive chemicals use so much glass equipment. It's also one reason for glass cooking ware and coffeemakers.

Glass offers a remarkable combination of properties that may make it useful to you—its controlled light transmission, for example—besides its chemical stability. Or its heat resistance and unique electrical characteristics. You'll find some interesting information about glass and its applications in our new edition of *"Glass and You."* Send for a copy today.



Sensitive pharmaceuticals are processed quickly and safely in this Corning brand glass cascade cooler. The chemical stability of the glass protects the product. Its corrosion resistance assures long service life, permits the use of low-cost river and sea water as coolant.

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Since its beginning in 1930, the magazine has dealt with the many uses and jobs that have been found for the more than 9,000 different types of electron tubes that have been developed and manufactured. New electronic devices, such as transistors, magnetic amplifiers and dialectic amplifiers, are included in the editorial scope of the magazine, with complete operating circuits and technical data for their applications.

Because new applications are found almost daily for electronic devices, the industry has expanded rapidly in recent years. Classed as one of the most important of the growth industries, its equipment and techniques are constantly outpacing textbooks. ELECTRONICS magazine fills the gap in time between the development of new devices and subsequent publication of textbook material by providing a rapid means of disseminating the technical information, both theoretical and practical, to design engineers in the field.

W. W. MacDonald
Editor, Electronics

Although the bulk of the editorial pages is devoted to technical data, a section of the publication provides business men, many of whom are also engineers, with business news and statistics. From such data management can determine trends and opportunities in the field.

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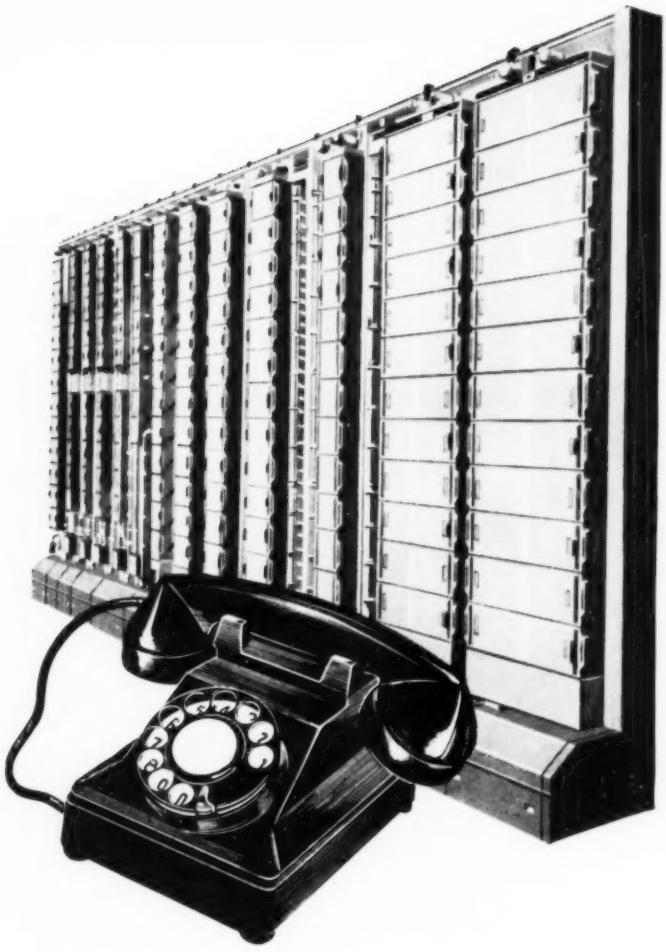

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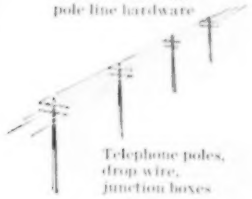

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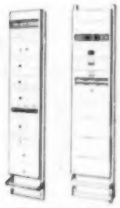

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